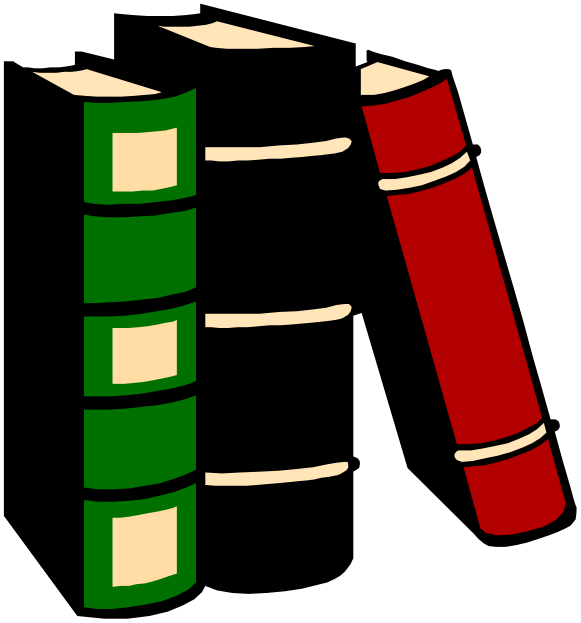

Coalition for
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An After-School Reading and Hands-On Science Program for Fourth Grade Students

The Coalition for Learning Opportunities and United Tutors (CLOUT) Program, a science literacy enhancement tool, assists fourth grade students in Denver area schools in raising their science reading skills. CLOUT is supported through a leveraged partnership between the U.S. Department of Energy (DOE), NREL, and the Denver Public School (DPS) District.

The CLOUT program is a weekly one-on-one tutoring experience between students and adult volunteers. Students augment their technical or science reading with activities related to the reading topics in technology or science.

This program was developed in response to state and national assessments of academic progress in reading that reveals students are most deficient in language arts skills (reading and writing) related to technical, life skills topics such as science and geography. Research indicates that greater student progress in reading about technical topics can be accomplished by linking reading with hands-on activities related to the topics, which describes the CLOUT program.

The intent of CLOUT is to combine topical reading with related hands-on activities to help improve student reading comprehension and sustain their reading progress and interest in the topic selected.

Staff from NREL's Office of Education Programs, work with DPS educators to implement the CLOUT program according to the particular needs of their school. DPS identifies the students who would most benefit from the program and provides the facility where the weekly tutoring sessions are to be held.

For additional information about CLOUT, contact Patrisia Navarro, (303) 275-3080, patrisia_navarro@nrel.gov at the National Renewable Energy Laboratory (NREL), Office of Education Programs, 1617 Cole Boulevard, Golden, Colorado 80401.

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Tutor Guidelines

We at the Department of Energy's National Renewable Energy Laboratory and Denver Public Schools are grateful to interested and caring volunteers who provide tutorial assistance to students. We value the contribution provided by dedicated tutors, and recognize the important role they have in making this program positive and rewarding.

The following are suggestions you may find helpful when establishing a relationship with your student.

- Greet students with a genuine interest that they can easily recognize.
- Accept students as they are. When appropriate, offer suggestions and alternatives for greater success.
- Show your true feelings. Openness and honesty will help form a meaningful relationship between student and tutor.
- Listen! Demonstrate interest in your student by really listening.
- Demonstrate that learning can be fun. Help students experience a measure of success as they work to improve areas of learning weakness.
- Provide as many new and different positive experiences as possible.
- Don't dwell on a negative. If something is not working, move on to something else – the next word, sentence, page. Or even change the focus momentarily and then come back to the reading or the activity.
- Maintain objectivity. Too great an emotional attachment to the student will hamper your effectiveness as a volunteer.
- Be sensitive to each student. Consider thoughtfully the many reasons for attitudes and actions. Offer suggestions, not judgments.
- Be patient. Changes and growth come as a result of many small steps in a positive direction.
- Avoid allowing personal concerns to enter into the tutoring relationship.

We are confident that your interest and dedication will be a powerful model to the student you tutor. What you personally give to the relationship between tutor and student will, in a large part, determine the benefits the student derives. The benefits will be two- fold – in the short term, your student will improve reading and science skills; in the long term, the impact of a meaningful relationship with a volunteer who cares about him/her will be profound and long lasting. Your student's accomplishments will be your reward!

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Tutor Responsibilities

The most important qualification for being a tutor is a willingness to share with a young student interested in reading and learning. All age groups, representing a variety of occupations, provide the tutoring skills necessary for students to gain confidence and pride in their abilities. Tutors experience a feeling of reward and pride as they see the results of their efforts in student growth over the course of the school year.

- You do NOT have to be a science expert, reading expert, or social worker. Just be a caring and concerned volunteer who is taking the time to show a struggling student that you care.
- CLOUT sessions are held for one hour once a week for an entire school year. You must arrive on time and be ready to read or assist with the hands-on science activity. Bring your CLOUT Notebook to every session to refer to the calendar and reading/activity lessons.
- In an effort to have everyone ready to start reading promptly at the designated CLOUT time, snacks and drinks are provided ten minutes before each CLOUT session. Tutors are welcome to have snacks with the students.
- If you cannot attend a CLOUT session for any reason, contact one of the substitute tutors on the Substitute Tutor list. If you are still unable to get a substitute, contact the CLOUT Program Manager immediately.
- Report disciplinary problems to the assigned CLOUT teacher as soon as possible. The teacher will work with you on possible corrective actions and suggestions of how to successfully work with the student.
- Report any vandalism or thefts to the assigned CLOUT teacher as soon as possible. To avoid these type of situations, do not bring purses, briefcases or other belongings into the school.
- As an NREL CLOUT tutor, you **cannot** communicate with your student outside of the parameters of the program. The purpose of the CLOUT program is to help struggling students improve their reading and science skills one hour per week.
- You are **not** allowed to drive a student home after a CLOUT session. It is the assigned teacher's/DPS' responsibility to make sure that no student's are left at school after CLOUT is dismissed.
- Reading days - Utilize the whole CLOUT hour wisely. Once your student has finished reading the featured book of the week, promote him/her to read one of the supplemental books provided.
- Activity days – Assist your student with the featured "hands-on science activity" but **do not** take over. If you see that your student is struggling, feel free to lend him/her a helping hand.
- If you decide to give your student a gift for holiday's, birthday's, etc., it **must** be related to science or reading and **must not** exceed the value of $10.00. Children tend to get hurt feelings when they see other students receive large extravagant gifts.
- Complete mid-year and end-of-the-year CLOUT program evaluations.

_____

Tutor Signature Date

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Tutoring Reading Format

Tutor Reads Aloud

Tutor reads the first page aloud from the book the student is reading. This gives the students exposure to the sound of “book language”, and a model of fluent reading. It also helps to establish a relationship between the tutor and student.

Student Reads Aloud

Student reads aloud to the tutor. If the student struggles, tutor may join in and do a “shared reading” with student, such as alternating pages.

Predict

From what you have read aloud to the student, have them predict what will happen next. This activates background knowledge and better prepares the student to be successful at reading. Asking the student to provide a rationale for his/her prediction causes him/her to be aware of the story and helps him/her to become a more strategic reader. After the student reads, he/she goes back and rethinks the predictions, then decides whether he/she was right, partially right, or wrong. This increases the student’s ability to self-monitor, another key behavior often missing in struggling readers. This may be an undeveloped or under-developed skill. You are not expected to turn him/her into an excellent predictor. But from working with your student patiently over time he/she will make progress in this area.

Vocabulary

A dictionary will be readily accessible for each student to look up any unfamiliar words that he/she may come across while reading. A list of these words is located at the end of each lesson.

Summarize

After the student has read, the tutor can help the student comprehend by asking questions about the reading. The tutor can use the "Suggested questions to ask" located after each book summary in the CLOUT notebook. Summarizing teaches the student to self-monitor his/her comprehension, another key behavior of skillful readers. Helping him/her recall main themes, characters, or facts will make the student begin making connections in the stories.

Supplemental Books

Supplemental books are provided for your student to read once he/she has completed the featured book of the week. It is very important to utilize the full hour wisely since the goal of the CLOUT program is to help improve their reading levels.

Rewards and Stickers

At the back of your notebook you will find a sheet protector with a variety of stickers. These stickers can be used as an incentive, to encourage or to praise or reward the student. The stickers can be used for a good job well done, reading a difficult book, pronouncing a difficult word or any situation the tutor may find appropriate.

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CLOUT Getting Acquainted Survey

NOTE to tutors: You may use these questions to break the ice and get to know your student. Do not grill the student but share equal amounts of information about yourself. General information that they are interested in about you; are you married, do you have kids, how old are they, how old are you, what do you do for work, etc.

The questions below are guidelines for you to use, if needed.

- When is your birthday?
- Do you have any brothers and/or sisters? What are their ages and names?
- Do you have any pets? What kind? What are their names?
- What kinds of things do you like to do outside of school? Favorite sports and activities? Favorite TV shows? Favorite foods? Favorite colors?
- How long have you been going to this school?
- What is your favorite subject at school? Why?
- What is your least favorite subject at school? Why?
- How do you feel about reading?
- When and how did you learn to read?
- What kinds of things do you like to read at school?
- What kinds of things do you like to read at home (books, magazines, newspapers, comic books, etc.)
- What is your favorite book?
- Does anyone in your family read to you? Who? When?
- Why do you think it's important to be a good reader?
- When you are reading and you come to a word you don't know, what do you usually do?

Add other questions, prior to the start of CLOUT.

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Topic:	Autumn
Objective:	Students will successfully complete reading one book: **The Autumn Equinox *Celebrating the Harvest*** by Ellen Jackson.
ISBN:	0-7613-1354-0
Reading Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading.

Featured Non-Fiction Book

The Autumn Equinox *Celebrating the Harvest* by Ellen Jackson

Summary
This book offers some fascinating descriptions of how different cultures celebrate the harvest season. Just as Americans today celebrate Thanksgiving, people of many cultures brighten this season of increasing darkness with festivals to give thanks for the harvest bounty that will sustain them through the long winter to come.

Suggested questions to ask

When does the Northern Hemisphere receive the most sunlight?
During the summer when the Northern Hemisphere of the Earth is tilted toward the sun causing the days to be longer.

When does the Northern Hemisphere receive the least amount of sunlight?
During the winter when the Northern Hemisphere of the Earth is tilted away from the sun causing the days to be shorter.

What and when is the autumn equinox?
It is the first day of autumn in the Northern Hemisphere when daylight and nighttime hours are about equal during the third week of September.

Why is Thanksgiving celebrated in the United States and Canada?
It is a harvest festival to give thanks for the fruits and vegetables, the nuts and grains, and the many treasures of the fertile earth.

Where does the word "cereal" come from?
The name of the Roman goddess Ceres, the goddess of the corn.

Who did the Greeks give thanks to when they had a successful harvest?
Demeter, the Greek goddess of agriculture and grain.

What did the Chinese rely on long ago to tell them when planting and harvesting should begin?
The movement and phases of the moon.

What is Samhain?
A Celtic festival in Great Britain and France that occurred at the end of October which was both a harvest festival and an occasion to honor the dead.

What did the Germanic people of northern Europe believe happened during harvest time?
They believed that hostile spirits walked the earth.

What did farmers in England do during the harvest?
They provided a feast of goose, roast beef, and plum pudding for the harvesters who had helped in the fields.

What did the Wampanoag Indians teach the Pilgrims in 1621?
They taught them which berries were safe to eat, how to grow corn, squash, and beans.

Who were the Iroquois and how did they celebrate the harvest?
They were a Native American people who lived in the eastern United States and Canada. They performed a Green Corn Dance to give thanks for the ripening of the corn.

Where were the Yoruba from and what crop did they harvest?
They were from Nigeria, West Africa and they harvested yams.

What is Sukkot?
An ancient Jewish harvest festival, which is still celebrated today.

What is Pongal?
It is a three-day harvest festival of southern India, which is held in January to honor the sun and rain that ripen the rice crops.

What do children in Angola do for their harvest festival?
Each child gathers ripe corn from the field and meet in the woods near a stream to roast corn on the cob.

In spite of modern day changes, why do we still celebrate the harvest in North America and parts of Europe?
It is a time to be grateful for the many wonderful foods that come to us from all over the world and to remember how much we depend on the earth and its many gifts.

Vocabulary

Note to Tutors
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- hemisphere
- axis
- autumn
- equinox
- harvest
- goddess
- barren
- spirits
- embers
- gourds
- sheaf
- bounty
- drenched
- feast
- ancestors
- makeshift

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Topic:	Color
Objective:	Students will successfully complete reading one book: **The Color Kittens** by Margaret Wise Brown.
ISBN:	0-307-10234-3
Reading Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading.

Featured Non-Fiction Book

The Color Kittens by Margaret Wise Brown

Summary
The book offers insights into how one can mix colors to create new colors. It is told using two very cute kittens and wonderful illustrations.

Suggested questions to ask

What were the names of the kittens?
The kitten's names were Hush and Brush.

What color were the kitten's eyes?
The kitten's eyes were green.

What did the kittens do or say about not being able to read the labels on the buckets of paint?
Hush said, "Red is red. Blue is blue."

What color paint were they missing?
They were missing green paint.

What colors did Brush mix first?
Brush mixed red and white.

What was the result?
Red and white made pink, not green.

What colors did Hush mix next?
Hush mixed yellow and red.

What was the result?
Yellow and red made orange, but not green.

What colors did they mix next?
They red and blue together and got a deep, dark purple.

What colors did they mix next?
They mixed yellow and blue together and got a green as green as grass.

After the kittens had finished mixing all of the colors, what did they do?
They painted everything around them.

What happened when the kittens got so excited?
They knocked over all of the paint buckets and all of the colors ran together.

What colors were mixed together to make brown?
Yellow, red, a little blue and a little black were mixed together to make brown.

What did the kittens dream about?
They dreamed of a red rose tree that turned all white when you counted to three.
They also dreamed about a purple land surrounded by a pink sea.
And a world of Easter eggs that danced around on little short legs.
They dreamt about a mouse that had a piece of cheese as big as a house.

What did the kittens do the next morning after they had woken up?
The kittens were wild with purring and pouncing.

After the kittens got too pouncy, what did they do?
They knocked over all of the buckets of paint so that all of the colors ran together.

Vocabulary

Note to Tutors
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- splashing
- buckets
- mixed
- bumblebee
- delighted
- prune
- excited
- tugboat
- disappear
- purring
- pouncing
- pouncy

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Science Activity:	Chromatography
Objective:	Students will successfully make colorful filter paper discs by separating black ink into its component colors.
Science Standards:	**Standard 2.1:** Students know that matter has characteristic properties, which are related to its composition and structure. In grades K-4, what students know and are able to do includes creating mixtures and separating them based on difference in properties (for example, salt and sand, iron filings and soil, oil and water).

Color Activity – Chromatography (Finding the Component Colors of Black)

Method
Students will find the colors that are components of the color black.

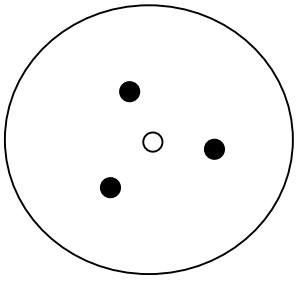
Materials Required

- 5 white, circular filter paper discs
- 5 pieces of black pipe cleaner
- 5 small plastic cups
- Water
- Vis-à-vis markers (Black, Blue, Green, Red)

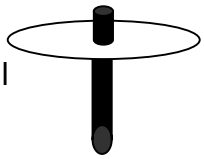
Procedure

1. Lay one of the white filter discs flat on the desk and draw an “x” right in the middle of the disc.

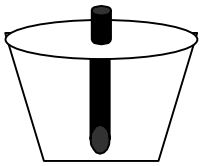
2. Using the black marker, make 3 dots equally spaced about the “x” at the center of the disc.



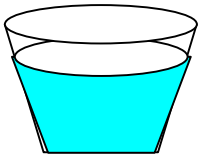
3. Use one of the pipe cleaners and push it through the “x” so that a small bit of it is poking through the hole. The long end of the pipe cleaner should be short enough so that it will not touch the bottom of the little cup.



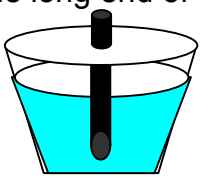
4. Test the length of the pipe cleaner by putting the disc and pipe cleaner into the cup with the long end down. The pipe cleaner should not touch the bottom of the cup.



5. Fill up one of the little cups with water so that it is within ¼ inch of the top rim.



6. Place the disk with the pipe cleaner on top of the cup with the long end of the pipe cleaner down into the water.

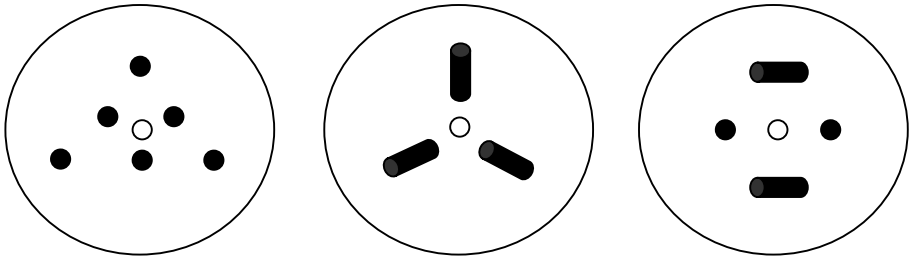


What do you think will happen? Why?

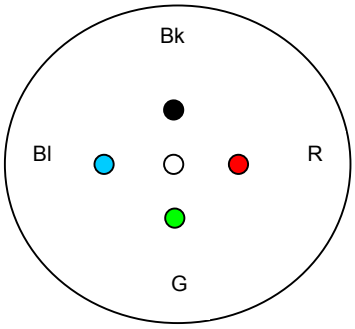
7. Carefully place the entire assembly out of your way.
8. Now repeat steps 1-6 with the remaining filter discs. Be creative and **place the marks in different spots.** It is possible that things won’t work so it is VERY IMPORTANT that you follow these simple guidelines:
   - Don’t make too many marks – use less than 8 marks total
   - Keep the marks short and simple like the ones to the right.
   - Do NOT use complex marks like the ones below.

   - Keep your marks close to the “x” in the middle of the disc. This won’t work well if your marks are far from the center and close to the edge of the disc.

9. Here are a few examples of how to make your marks.



10. As you complete each disc, place it (with the water-filled cup) out of the way on your desk and continue. Be VERY careful as you move them – don't let the water splash onto the paper filter.
11. Let's see what happens when we try using colors other than black. To help you remember which color is which, label the color out by the edge of the disc. Use R for the color Red, Bl for the color Blue, G for Green, and Bk for Black.



What do you think will happen to this disc?

When you are finished, look at the one you did first. What do you notice? We will leave these for a few minutes and go on to the next activity. We will check on them in 15 minutes.

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Science Activity:	Color Mixing
Objective:	Students will successfully mix colors using a solvent in making a colorful T-shirt.
Science Standards:	**Standard 2.1:** Students know that matter has characteristic properties, which are related to its composition and structure. In grades K-4, what students know and are able to do includes creating mixtures and separating them based on difference in properties (for example, salt and sand, iron filings and soil, oil and water).

Science Activity - Color Mixing

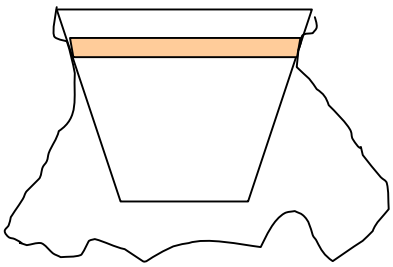
Method
Students will mix colors on T-shirts made from markers using rubbing alcohol as a solvent.

Materials Required

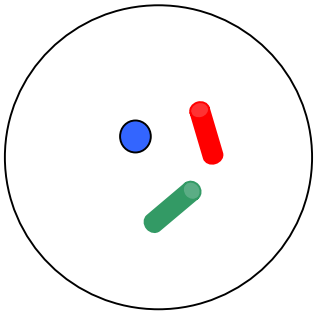
- White T-shirt
- Plastic Cups – 3 large, 3 medium, and 3 small
- 6 Rubber bands
- Sharpie markers – 4 assorted colors
- Small plastic dropper bottle filled with rubbing alcohol

Procedure

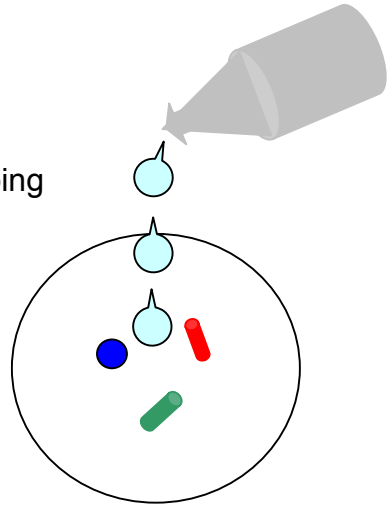
1. Write your name on the T-shirt label with one of the Sharpie markers.
2. Take the large cup, the large rubber band and the T-shirt.
3. Stretch the T-shirt over the top of the cup so it is covering the top opening of the cup.
4. Use the rubber band to secure the T-shirt stretched over the top of the cup. (Side view).



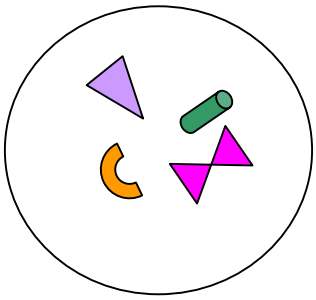
5. Using one of the Sharpie markers, make 2 or 3 simple marks close to the center of the part of the T-shirt stretched over the cup. Try not to have any of your marks actually be directly in the center. Also, try not to have your marks too close to the edge of the circle. (Top view).



6. Now take the dropper bottle and drip **20 drops** of rubbing alcohol **directly on the CENTER of the circle**.



7. What do you think will happen to the colors? Why?
8. Observe what is happening – why do you think the colors are doing this?
9. Leave the cup and rubber band where it is.
10. Take another cup and another rubber band and, on a different part of the T-shirt, do the same thing we did the first time – stretch the T-shirt over the cup and secure it with the rubber band.
11. Now use markers with some colors other than those you used the first time and make more marks within the circle.



12. Be creative with the marks you make. Here are a few to give you some ideas.

13. Guidelines for your marks:
    - Don't make too many marks – use less that 8 marks total.
    - Keep your marks close to the middle of the circle.
    - Pay attention to how the colors mix and which colors mix to create new colors or effects that you like so that you can repeat the ones you like best.
14. Continue this process and make a few more colorful circles on your T-shirt.
15. Use one of the markers to put your name somewhere on your T-shirt. You can do it small on the bottom of the shirt or any size and anywhere you like.

What is happening to the colors on the T-shirt and why?
The colors from the markers are quickly absorbed into the T-shirt fabric. Normally, they would dry right there although they may "run" or "bleed" a little if you were to wash them.

By using a **solvent** such as **rubbing alcohol**, the ink is "loosened" from the T-shirt fabric and it moves along with the rubbing alcohol as it spreads out and gets absorbed into the cloth. The ink spreads out and becomes less concentrated as it spreads. As the ink from one color runs into the ink from another color, the colors mix in a manner similar to mixing paint. (Just like what the "Color Kittens" did.)

Note: All of the T-shirts will need to be put in a clothes dryer so that the ink will not run when they get wet. Otherwise, when you put the T-shirt in the washer, all of your clothes will come out with multi-colors – which you or your parents may not like. Your program coordinator will take the T-shirts and put them all through the dryer so you will be able to take them home the following week. That is the purpose of putting your name on the t-shirt – so we will know whose T-shirt is whose.

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Topic:	Dinosaurs
Objective:	Students will successfully complete reading one book: **A Dinosaur Named Sue** by Fay Robinson.
ISBN:	0-439-09983-8
Reading Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading.

Featured Non-Fiction Book

A Dinosaur Named Sue by Fay Robinson

Summary
This book talks about the amazing discovery of a 67 million year old Tyrannosaurus rex which is the largest and most complete fossil ever found.

Suggested questions to ask

What state in North America is one of the best places in the world to find fossils such as dinosaur bones?
South Dakota.

Who is Susan Hendrickson?
She is a fossil hunter who camped out in western South Dakota with her dog Gypsy and a group of people from the Black Hill Institute in the summer of 1990.

What dinosaurs were Susan and the Black Hills Institute group digging up?
Duck-billed dinosaurs called Edmontosaurus.

Why was the second to the last day of the fossil hunt strange?
There is never fog in South Dakota in the summer time and that day, there was thick fog and the air was cool and still.

What did Susan and Gypsy do when the others went to town to get a new tire?
They hiked through the thick fog across the valley to a place on the cliffs that they hadn't explored due to lack of time.

How long was the hike and how much time did it take?
It was seven miles long and it took more than two hours.

What is the first thing, fossil hunters do when they're looking for bones in cliffs?
They walk around the bottom to look for bones that might have fallen downhill.

What did Susan find after fifteen minutes of walking around the bottom of the cliff?
A couple of two-inch pieces of bone and a bunch of little broken bone pieces.

What did she see eight feet above the bones? What did she do?
She saw more bones that jutted out of the cliff so she climbed up for a closer look.

Were the bones hollow? Which dinosaurs have hollow bones?
Yes. Meat eating dinosaurs called carnivores.

What are herbivores?
Plant-eating dinosaurs.

What kind of dinosaur did these bones belong to?
Tyrannosaurus rex.

What did Susan do when she realized that the bones were of a T-rex?
She picked up two pieces of bone and ran back to the camp to show the others.

What did the group name the dinosaur and why?
They named it Sue in honor of its discoverer.

Explain what the group had to do before all of Sue's bones could be uncovered.
They had to clear away 30 feet of rock by chipping, digging and breaking away the cliff thirteen hours a day using shovels, picks and crow bars.

Why was this discovery a find of a lifetime?
Sue was huge and almost all of the bones were found and were nearly perfect. Most dinosaur skeletons that are found are missing many, if not most, of their bones.

Who discovered the fossils of the first Tyrannosaurus rex and when?
A man named Barnum Brown in 1900.

Who gave the Tyrannosaurus rex its name?
Barnum Brown's boss Henry Osborne from the American Museum of Natural History.

What does Tyrannosaurus rex mean?
Tyrant lizard king.

How big was the T-rex?
Bigger than a city bus. About 40 feet long and 13 feet high at the hips.

How much did it weigh? How many pounds = a ton?
Anywhere from 2 to 7 tons. 2,000 pounds = 1 ton.

Describe the Tyrannosaurus rex.
It had a huge head, and a heavy tail to keep its balance. Arms as long as human adult arms. Jaws full of 58 long teeth.

What continent is the T-rex a species of and how many have been found as of 1998.
It is a species of North America and 22 specimens have been found all in Canada or the western United States.

What is so special about Sue's bones?
More of her bones are preserved than any of the other T-rex skeletons and she is 90% complete.

How long ago did Sue live?
About 67 million years ago near the end of the Cretaceous period.

List three other dinosaurs that roamed the land with Tyrannosaurus rex's in the Cretaceous period:

- Plesiosaurs
- Triceratops
- Hadrosaurs
- Parasaurolophus
- Troodon
- Ankylosaurs

Explain what it was like when Sue roamed the Earth.

What type of rock was Sue's bones found in and what was it formed from?
Sandstone which is formed from sand.

What is it called when sand and mud collect and settle?
Sediment.

What caused Sue's bones to become discovered?
The wearing away of rock caused by forces inside the Earth that moved the land; Formation of mountains, enormous earthquakes and volcanoes; and cooling weather and rain.

What did the people from the Black Hills Institute do with the bones?
They dug them out individually or in blocks, covered them in foil and then applied plaster casts to the bones in order to protect them.

Where did they take the bones and why?
They took the bones to the Black Hills Institute in four trucks to clean and prepare each bone.

Why couldn't the Black Hills Institute keep Sue?
Sue belonged to the landowner on whose land she was found.

What did the landowner do with Sue?
He sold her in an auction to the Field Museum in Chicago for more than eight million dollars.

What can you see at the Field Museum in Chicago?
Sues bones being cleaned in the McDonald's Fossil Preparation Lab by preparators.

What do preparators do?
They remove the rock covering fossil bones so that the bones can be seen and studied.

What is the matrix?
The scientific name for the non-fossil rock that still surrounds the bones.

What is the museum planning to do with Sue?
Put the bones together and display it in the museum for everyone to view.

Vocabulary

Note to Tutors

These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- fossil
- Edmontosaurus
- institute
- carnivores
- herbivores
- exhausted
- vertebrae
- tyrant
- ton
- species
- specimen
- preserved
- plaster
- scientist
- Cretaceous period
- Pterosaurs
- Pleisiosaurs
- Hadrosaurs
- Parasaurolophus
- Troodon
- Ankylosaurs
- skitter
- humid
- bellowing
- trudged
- fierce
- sandstone
- flesh
- jumbled
- sediment
- seeped
- brittle
- dispute
- auction
- gasped
- bidding
- interpretation
- matrix
- exhibit
- descendants
-
-

Coalition for
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Topic:	Dinosaurs
Objective:	Students will successfully complete reading one book: **Why Did The Dinosaurs Disappear? by Melvin and Gilda Berger.**
ISBN:	1-57102-026-8
Reading Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading.

Featured Non-Fiction Book

Why Did the Dinosaurs Disappear? by Melvin and Gilda Berger

Summary

The book offers a lively examination of the various theories of why the dinosaurs disappeared. Educational text and accurate, detailed illustrations are combined in the exciting look at a prehistoric mystery.

Suggested questions to ask

What happened to the dinosaurs? They disappeared and became extinct.

What does extinct mean? It means that an animal is gone forever. Ask your student if they know of any other animals that have become extinct.

What two clues can help us solve the mystery of why the dinosaurs disappeared? Fossils and rocks in the earth.

What are fossils and give examples? They are remains of animals that lived long ago such as teeth, bones and footprints.

How do the rocks in the earth tell us the history of what happened many years ago? Each layer contains different kinds of fossils.

When did dinosaurs rule the earth? 225 million years ago.

What do fossils and rocks tell us about the different kinds of dinosaurs? How they lived, how big they were, what they ate, and how fast they ran.

What is the name of the biggest dinosaur ever found? Brachiosaurus. Ask your student what his or her favorite dinosaur is.

How big was the Compsognathus dinosaur? It was about the size of a chicken.

Which dinosaur had teeth that were 6 inches long and use to eat other dinosaurs? Tyrannosaurus Rex.

How many horns did theTricerotops have? Two pointy horns that were three feet long, and one horn that was short and less pointy.

What did the Ankylosaurus look like? It was covered with thick bony plates and the end of its tail was like a giant club.

How long was the Diplodocus dinosaur? Ninety feet long!

Which dinosaur could run faster than any racehorse? The Struthiomimus; it could run 30 miles an hour?

What do Paleontologists study? They study plants and animals that lived long ago by finding clues in fossils and rocks.

Why would cold weather have caused the dinosaurs to disappear? Dinosaurs were cold –blooded animals and had no fur or feathers to keep them warm. Also, plants cannot grow in the cold so dinosaurs may have starved. Ask your student what other animals are cold-blooded.

How would an exploding star have caused the extinction of dinosaurs? By sending out cosmic rays, which cause living creatures to get sick and die.

What is an asteroid and how could it have caused the dinosaurs to die? It is a giant hunk of rock that circles the sun. One may of hit the Earth causing fires and darkness.

What do you think happened to the dinosaurs? Did they disappear because of cold weather, cosmic rays, an asteroid, or lack of sunlight?

What was found in 1992 and where? A large crater that was created by an asteroid was found on the coast of Mexico.

Vocabulary

Note to Tutors:
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- extinct
- paleontologist
- warm-blooded
- crater
- fossils
- climate
- cosmic rays
-
- armored
- cold-blooded
- asteroid
-

Coalition for
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Science Activity:	Dinosaur Excavation
Objective:	Students will successfully excavate and identify a fossil of dinosaur. The students will know general characteristics of the dinosaur that they excavate.
Science Standards:	Standard 4.1: Students know and understand the composition of Earth, its history, and the natural processes that shape it. In grades K-4, what students know and are able to do includes: describing different types and uses of Earth materials (for example, rocks, soil, minerals, etc.); recognizing that fossils are evidence of past life.

Dinosaur Activity – Dinosaur Excavation

Method
Students will excavate and identify a fossil of a dinosaur. There are three different dinosaur kits: Tyrannosaurus Rex, Velociraptor, and Stegosaurus. The students will know the general characteristics of the dinosaur that they excavate.

Materials

- Newspaper
- Masking Tape
- Scissors
- Toothpick
- Safety Glasses - Tutor
- "I Dig Dinosaurs Excavation Kit" which includes:
  - Dinostone
  - Safety Glasses - Student
  - Chisel
  - Hammer
  - Paint
  - Paint Brush

Procedure
You will use the “I Dig Dinosaur Excavation Kit” just like a real paleontologist.

What is a paleontologist? It is a scientist that studies fossils like plants and animals that have lived long ago. They are like detectives of the ancient past.

You will need to be a detective to find clues to the type of dinosaur that is buried in your Dinostone.

NOTE: Have the student write his/her name on the outside label of the box. This activity will take two CLOUT sessions to finish.

1. Spread newspaper on the entire surface of your work area and use the masking tape to keep it in place. This will help catch all of the sand once you start excavating.
2. **SAFETY RULES:**
   - You **must** wear your safety glasses the entire time you are excavating.
   - The chisel and hammer are made of heavy metal and must be handled carefully. These are **NOT** toys and students must be cautious when using them. Never hammer towards yourself or towards another person. The chisel and hammer need to be returned to the program coordinator at the end of this activity. **Tutors, please collect these items.**
   - The sand used in this kit is non-toxic and can be disposed of safely in your garden or garbage. Do not dump the sand down the sink, it will clog up the drain.
3. Put on your safety glasses.
4. Place the Dinostone on the newspaper in the center of your work area.
5. Cut the plastic off the Dinostone with your scissors.
6. Start chiseling from the top of the Dinostone, working down to the skeletal remains.
7. Hold the chisel with the sharp end at an angle to the Dinostone block. Tap the blunt end with your hammer. If you are right handed the hammer should be in the right hand with the chisel in the left. If you are left handed, the hammer should be in the left hand with the chisel in the right. This will give you better control over the tools so you don’t whack your hand with the hammer.
8. Tap firmly. Do not hit the Dinostone so hard it breaks away in large blocks.
9. Try to chisel away each layer, one layer at a time. Do not hammer the chisel very deep. This excavation process takes a long time. You might want to alternate with your tutor because your arms will get tired.
10. You must be careful to avoid breaking the fossil bones.
11. Brush the loose sand grains away from the bones.

12. Once bones are exposed, aim the chisel away from the bone and away from you and continue to chip away the sand by the bone.
13. Use the brush or the head of the hammer to frequently remove the loose sand. This will give you a better view of the bones.
14. Do your excavation by alternating the use of the brush and chisel until the bones are exposed. You can move the Dinostone around to uncover the bones.
15. Scrape near the bone to expose the edges of the dinosaur bones.
16. Do **NOT** pry the bones free. This can break the bones.
17. Once all of the bones have been removed, rub any loose particles of sand from the skeleton.
18. Take the wooden toothpick and dig the grains of sand out of the small holes and grooves.
19. Take out the assembly instructions from the kit and follow the instructions to snap together the dinosaur that you have excavated. Remember, there are three types of dinosaurs in the kits: Tyrannosaurus Rex, Velociraptor, and Stegosaurus.
20. Tutors: You will need to help the students with the assembly of the dinosaur.
21. What kind of dinosaur do you have? Take out the “I Dig Dinosaurs” information booklet and read about the dinosaur that you have excavated.
22. Clean Up: Have the students empty the sand into the dinosaur box. There is an option to build a base for your dinosaur to stand on with the left over sand. The instructions to make the mold are included in the kit and can be completed at home.
23. There are also instructions on painting the dinosaur. The paints and brush are provided in the kit. If they want to, they will be able to paint the dinosaur at home.

TUTORS: If your student finishes excavating and assembling the model of the dinosaur, have them read one of the supplemental dinosaur books provided.

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Topic:	Electric Vehicles
Objective:	Students will successfully complete reading one book: **Green Cars – Earth-friendly Electric Vehicles** by John Coughlan.
ISBN:	1-56065-211-X
Reading Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading.

Featured Non-Fiction Book

Green Cars – Earth-friendly Electric Vehicles by John Coughlan

Summary
The author, John Coughlan, discusses electric cars from a variety of different viewpoints – their history, companies making them, batteries, and what the future might hold.

Suggested questions to ask

What is an electric car?
An electric car is a car that is powered by an electric engine (rather than a conventional gasoline engine).

Are many automobile companies making electric cars?

Almost every automobile company are developing or making an electric car. Some are for sale now, others will be ready for sale in a few years.

How do gasoline engines work?
The engine power comes from a series of small, controlled explosions of gasoline. The explosion pushes a piston, which in turn pushes a rod, which turns a shaft that makes the wheels turn.

Where does the electricity that an electric car uses come from?
The electricity comes from energy stored in a battery.

How is a battery like a sponge?
A sponge soaks up water that can be squeezed out later; a battery soaks up electricity that can be used later.

When did people first start using electric cars?
Electric cars were first used in the late 1800's and early 1900's.

When and why did people stop using electric cars?
Improvements in gasoline-powered engines and the changing tastes of the public made electric cars less popular after 1920.

When did car makers start becoming interested in electric cars again?
In the 1960's, car makers started to look at making electric cars again.

What is a green car?
A green car is the name given to cars that cause little or no pollution.

What fuels can be used for cars that are cleaner than gasoline?
Methanol, ethanol, hydrogen, and natural gas all burn cleaner than gasoline.

Why don't we see many electric cars on the road today?
Electric cars are much more expensive than standard cars. Electric cars can only go 75-150 miles on a single charge (it needs to be further, like 200-400 miles). Electric cars do not have waste heat that can be used to defrost or heat a car.

Vocabulary

Note to Tutors

These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- electric
- battery
- engine
- minivans
- independent
- converting
- future
- standard
- explosions
- controlled
- piston
- exhaust
- spark plug
- sponge
- electrical outlet
- kilometer
- skeleton or frame
- recycled
- recharging
- lightweight
- pollute
- environment
- issue
- expensive
- experimental
- range
- cockpit
- helicopter
- commuter car
- exhaust
- cancer-causing
- device
- stylish
- promising
- convenience store
- defroster
- zero-emission
- considering
- require

Coalition for
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Science Activity:	Building a Solar Powered Model Car
Objective:	Students will successfully build a PV-powered model car.
Science Standards:	**Standard 2.2:** Students know that energy appears in different forms, and can move (be transferred) and change (be transformed). In grades K-4, what students know and are able to do includes: recognizing that energy (for example, light heat, motion, sound, mechanical) can affect common objects and is involved in common events.

Electricity Activity – Building Solar Powered Model Cars

Method
Students will build and race model cars powered by solar energy.

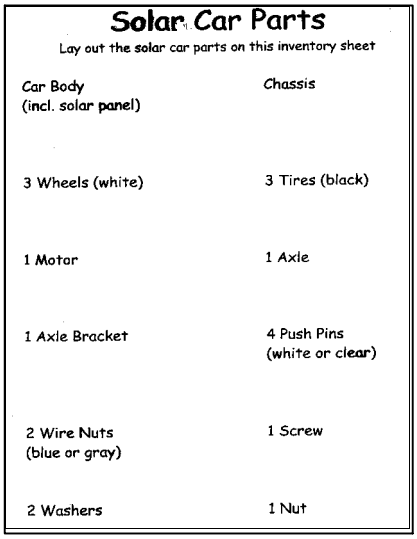
Materials Required

- Inventory sheet
- Scissors
- Label for car name
- Screwdriver
- Wrench
- Scotch tape
- Solar Model Car Kit which includes:
  - Plastic Chassis & Body
  - 1 Solar Panel
  - 3 Wheels
  - 3 Tires
  - 1 Motor
  - 1 Axle
  - 1 Axle Bracket
  - 2 Wire Nuts
  - 2 Washers
  - 4 Push Pins
  - 1 Screw
  - 1 Nut

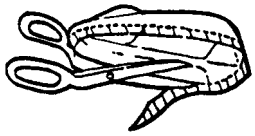
Procedure

24. Place inventory sheet on a flat surface. Open car kit and remove plastic piece and bag of small pieces. Carefully open bag of small parts and place on the inventory sheet underneath the appropriate part name.

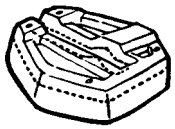
    NOTE: The plastic chassis and body will not fit on the inventory sheet. Also if you are missing small pieces check the motor. The screws and nuts often stick to the motor.



25. Cut out the body with scissors from the plastic sheet.
26. Look along the body's side and locate the line about ¼" up from the bottom. Now cut along that line all around the body.

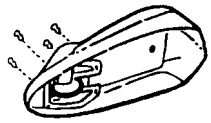


27. Cut out the chassis from the plastic sheet.
28. Look along the chassis's side and locate the line about ¼" up from the bottom. Now cut along that line all around the chassis.
29. Cut out the center rectangle of the chassis. DO NOT CUT THROUGH THE END.

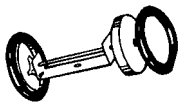


30. Locate a crescent shaped line along the side of the cut out rectangle where the motor is to be mounted. Carefully cut out the crescent shape.
31. Smooth the crescent shaped cut edges so the motor does not get caught on any rough plastic.
32. Make a crescent shaped cut on the other side of the cut out rectangle directly across from the first crescent shaped cut. This cut is so the drive wheel does not rub on the plastic.
33. Put the body and chassis on the table out of the way.
34. Take a wheel, tire, and motor from the inventory sheet.
35. Insert the tire over the wheel.
36. Place the wheel on the table with the side with the bump face down. Push the motor into the wheel. BE CAREFUL NOT TO PUSH ON THE WIRE LEADS ON THE MOTOR!
37. Put the motor/wheel in the chassis with the wheel in the center rectangle. Does the wheel spin freely? If the wheel catches on any plastic cut away more plastic from the middle rectangle and notches as needed. The wheel must turn freely without obstruction.

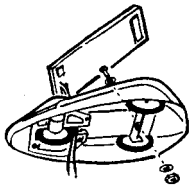
38. Once the wheel spins freely, remove the tape cover on the motor and stick the motor to the chassis. Remember the wheel is in the cut out rectangle and the wires are on the outside of the chassis.
39. Now remove the solar panel from the body. Gently pull the connecting wires from the hole in the body. Peel off the clear tape from the top of the solar panel. Place on the table out of the way.



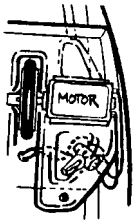
40. The chassis will be connected to the underneath of the body. Match the 4 holes in the chassis with 4 holes in the body.
41. Insert the 4 plastic push pins one at a time from the top of the body down through the chassis.
42. Put the tires on the 2 remaining wheels.
43. Slip the axle into the axle bracket. Push one wheel onto the axle **CAREFULLY. THE AXLE CAN PUNCTURE YOUR FINGER BE SURE NOT TO PUT YOUR FINGER OVER THE HOLES IN THE WHEELS**. Firmly push the last wheel on the axle **CAREFULLY.** You may need to use the scissors to hammer the wheel onto the axle.



44. Check to see if the wheel/axle assembly fits inside the back end of the body. If the wheels rub or do not fit inside the body frame use your scissors to hammer the wheels further onto the axle.
45. Take the metal screw and put a washer on it.
46. Hold the axle bracket underneath the body with the hole in the bracket and body aligned.
47. Insert the screw and washer from the top of the body through the axle bracket.



48. Flip the car over holding the screw in place. Place a washer on the screw from the underside of the car.
49. Then place the nut on the screw and tighten into place. Use a screwdriver and wrench to tighten the screw.
50. Once the wheels are straight, tighten them into place and gently push the wires from the solar panel back through the hole in the body. Take the cover off the tape on the panel and press the solar panel onto the body.
51. Connect the red wire of the solar panel to the red wire of the motor by twisting the stripped wire ends together. Then twist a wire nut on the connected wires. Repeat for the blue wires.
52. Tuck the wire nuts/wires up under the chassis if possible. If necessary, tape the wires to the underside of the chassis or body so they do not drag on the ground.



Conclusion: Go out into the sunlight and test the car.

REMEMBER THERE IS NO <u>ON</u> AND <u>OFF</u> SWITCH!! To avoid damage to your Solar Model Car keep it stored in an area which is not directly hit by sunlight.

Solar Car Parts

Lay out the solar car parts on this inventory sheet

Car Body
(Includes solar cell)

Chassis

3 Wheels (white)

3 Tires (black)

1 Motor

1 Axle

1 Axle Bracket

4 Push Pins
(white or clear)

2 Wire Nuts
(blue or gray)

1 Screw

2 Washers

1 Nut

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Topic:	Electricity
Objective:	Students will successfully complete reading one book: **Discovering Electricity** by Rae Bains.
ISBN:	0-89375-565-6
Reading Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading.

Featured Fiction Book:

Discovering Electricity by Rae Bains

Summary
Discovering Electricity is an informative book that describes electricity in easy to understand terms with useful pictures to enhance the explanations.

Suggested questions to ask

What are some appliances or devices that you use that are powered by electricity?

What is electricity?
Electricity is a kind of energy that gives us heat, light, and power. It is an action, not a thing.

What is everything in the world made of?
Atoms.

How big are atoms?
Atoms are very small. Atoms are so small that millions and millions of them fit on the head of a pin!

What part of an atom sometimes flies off by itself?
Electrons sometimes fly off by themselves.

When you rub a comb through your hair, what happens to the electrons?
Electrons jump from your hair to the comb.

How do we get electricity to where we need it?
We use wires to transfer electricity to where we need it.

How are wires like pipes?
Wires carry electricity in the same way that pipes carry water.

Where does a flashlight get its power from?
Flashlights get power from batteries. A battery is a small electrical generator.

What is a circuit?
It is a path that allows electricity to move on it.

How thin is the wire in a glass bulb?
The wire is a glass bulb is thinner than a hair!

What happens when the wire in a bulb gets really hot?
The wire will give off a "glow" that we call a light.

What happens when you switch a flashlight "off"?
The circuit is broken, the flow of electrons stops, and the bulb stops glowing.

What happens when you rub your shoes on a rug or carpet a few times and then touch a metal object?
You get a tiny shock.

What are wires usually covered with? Why?
Rubber is often used to cover wires because it is a good insulator.

What are some other good insulators?
Glass, plastic, and dry wood.

What are some good conductors? Most metals are good conductors.

Is water a conductor or insulator?
Conductor.

Why is it not safe to swim in a storm?
Lightning may strike the water and conduct an electrical shock to you.

Why are different gasses used in some buildings?
Because the different gasses will allow the light to be different colors, like red, yellow, blue, or green.

What is a meter?
A meter measures all of the electricity you use in your home.

What do circuit breakers and fuses do?
They act like “traffic cops” to stop the flow of electricity if too much electricity gets in a wire.

Now name some of the devices or appliances you use electricity to operate?
Light bulbs, refrigerator, toaster, iron, blender, radio stereo, telephone, flashlight, etc.

Vocabulary

Note to Tutors
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- zigzag
- refrigerator
- atoms
- electron
- million
- comb
- pillow
- socket
- faucet
- battery
- generator
- circuit
- glow
- doorknob
- insulation
- conductor
- tubes
- gas
- meter
- circuit breaker
- fuses

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Science Activity:	Constructing a PV-Powered Circuit Board
Objective:	Students will successfully construct an electric circuit board.
Science Standards:	**Standard 2.2:** Students know that energy appears in different forms, and can move (be transferred) and change (be transformed). In grades K-4, what students know and are able to do includes: recognizing that energy (for example, light heat, motion, sound, mechanical) can affect common objects and is involved in common events.

Electricity Activity – Constructing a PV-Powered Circuit Board

Method
Students will build a quiz board to understand simple circuits and photovoltaic cells.

Materials:

- Photovoltaic Cell w/ wires
- Buzzer
- Aluminum foil
- Scissors
- Masking tape
- Duck tape
- Paper punch
- Quiz board

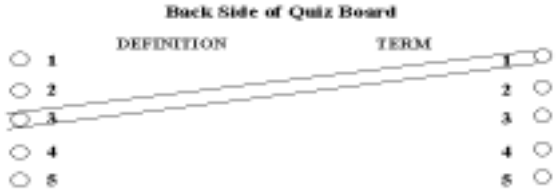
Procedure
To construct a simple circuit, we will use aluminum foil, wires, a photovoltaic cell and a buzzer. We will use the light from the sun to transfer electrons from the photovoltaic cell to the quiz board which will set off an audible buzzer. (An overhead projector can also be used as a light source if the sun isn't cooperating.)

1. Take your quiz board and punch a hole to the side of the first term.

Discovering Electricity
Quiz Board

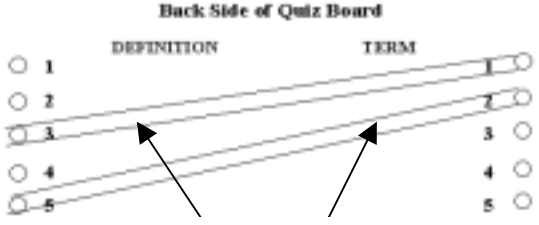
TERM	DEFINITION
Battery	A device that measures how much electricity is used.
Electricity	A steady flow of electricity.
Meter	A very small electrical generator.
Circuit	A complete or unbroken path that allows electricity to flow.
Current	A type of energy that gives us heat, light, and power.

2. What definition best describes the term *"Battery"*?
3. If you chose *"A very small electrical generator"*, you're absolutely right! Punch a hole next to this definition.
4. Turn the quiz board over and place it face down so the back is facing you.
5. Cut a ½ inch wide strip of aluminum foil that is long enough to reach from the term hole to the correct definition hole.
6. Do not fold the foil or roll it into a wire, it works best when it is flat.
7. Connect the foil strip on the back of the quiz board from the term hole to the definition hole. Make sure the foil is visible through the punched holes on the front side of the board.
8. Completely cover the foil strip with masking tape to secure it to the back of the card and to insulate the strip from the other strips you will attach.
9. Congratulations! You have made your first simple circuit.



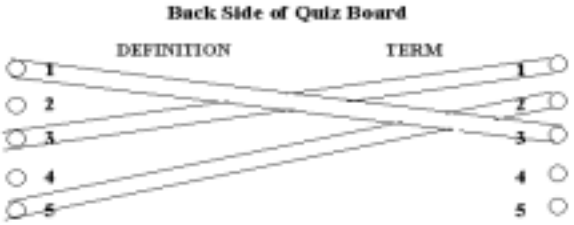
***Completely cover aluminum foil strips with masking tape for insulation.**

10. Now take your quiz board and punch a hole to the side of the next term.
11. What definition best describes the term *"Electricity"*?
12. If you chose *"A type of energy that gives us heat, light and power"*, you're absolutely right! Punch a hole next to this definition.
13. Repeat steps 4 – 8 to create the second simple circuit.



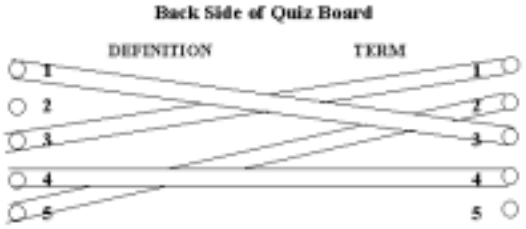
***Completely cover aluminum foil strips with masking tape for insulation.**

14. Now take your quiz board and punch a hole to the side of the next term.
15. What definition best describes the term *"Meter"*?
16. If you chose *"A device that measures how much electricity is used"*, you're absolutely right! Punch a hole next to this definition.
17. Repeat steps 4 – 8 to create the third simple circuit.



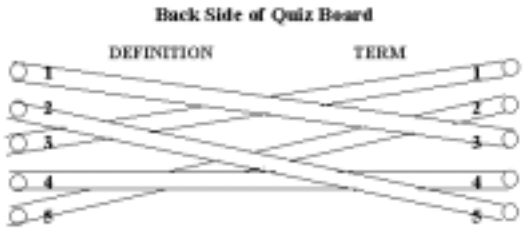
***Completely cover aluminum foil strips with masking tape for insulation.**

18. Now take your quiz board and punch a hole to the side of the next term.
19. What definition best describes the term *"Circuit"*?
20. If you chose *"A complete or unbroken path that allows electricity to flow"*, you're absolutely right! Punch a hole next to this definition.
21. Repeat steps 4 – 8 to create the fourth simple circuit.



***Completely cover aluminum foil strips with masking tape for insulation.**

22. Now take your quiz board and punch a hole to the side of the last term.
23. What definition best describes the term *"Current"*?
24. If you chose *"A steady flow of electricity"*, you're absolutely right! Punch a hole next to this definition.
25. Repeat steps 4 – 8 to create the last simple circuit.



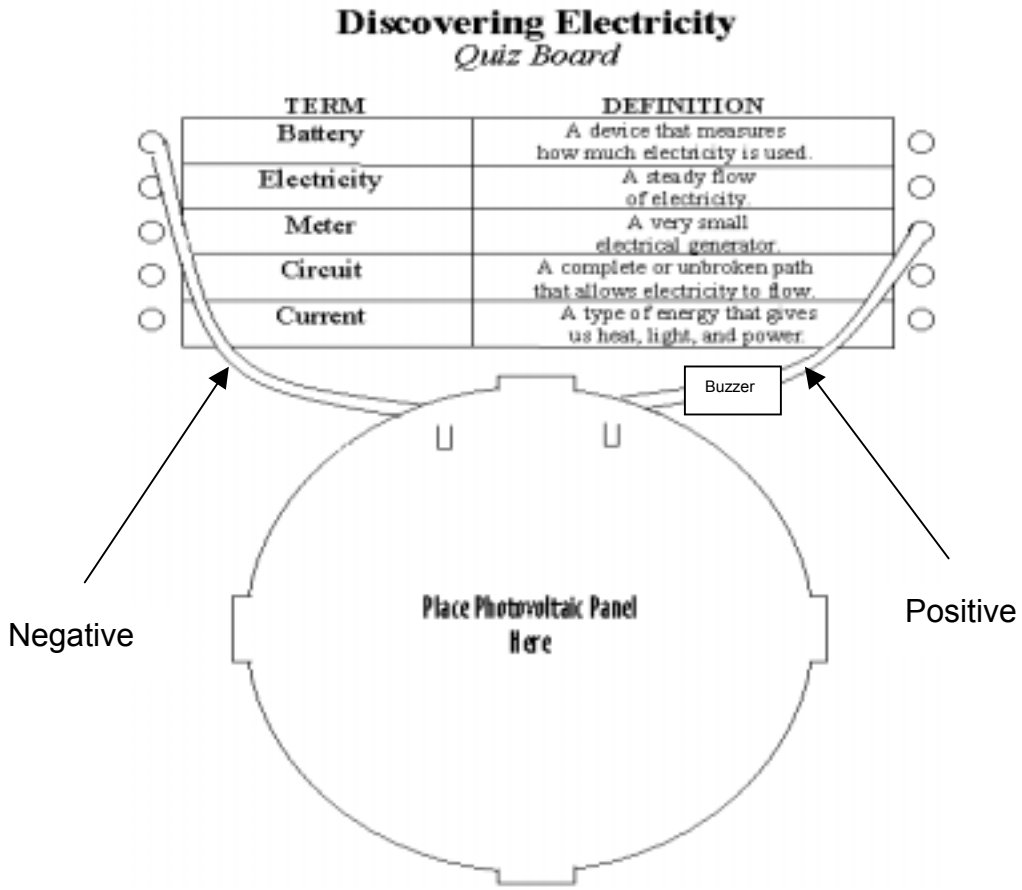
***Completely cover aluminum foil strips with masking tape for insulation.**

26. Congratulations! You have completed all five simple circuits!

27. Now flip your quiz board right side up.
28. Roll a piece of duct tape and place it on the back of the PV cell to secure it to the quiz board.
29. You are now ready to test your quiz board.

Quiz Board Operation

30. Find a nice sunny spot to test your quiz board. **Note:** The PV cell needs sunlight to operate. Do not block the surface of the PV cell with your body or with the quiz board.
31. Start with the first term – Battery. Touch the end of the black wire to the foil in the hole next to term.
32. Touch the buzzer's black wire to the foil in the hole next to the correct definition. If your circuit was done correctly, you should hear the buzzer!
33. Repeat the steps above for each term and definition.



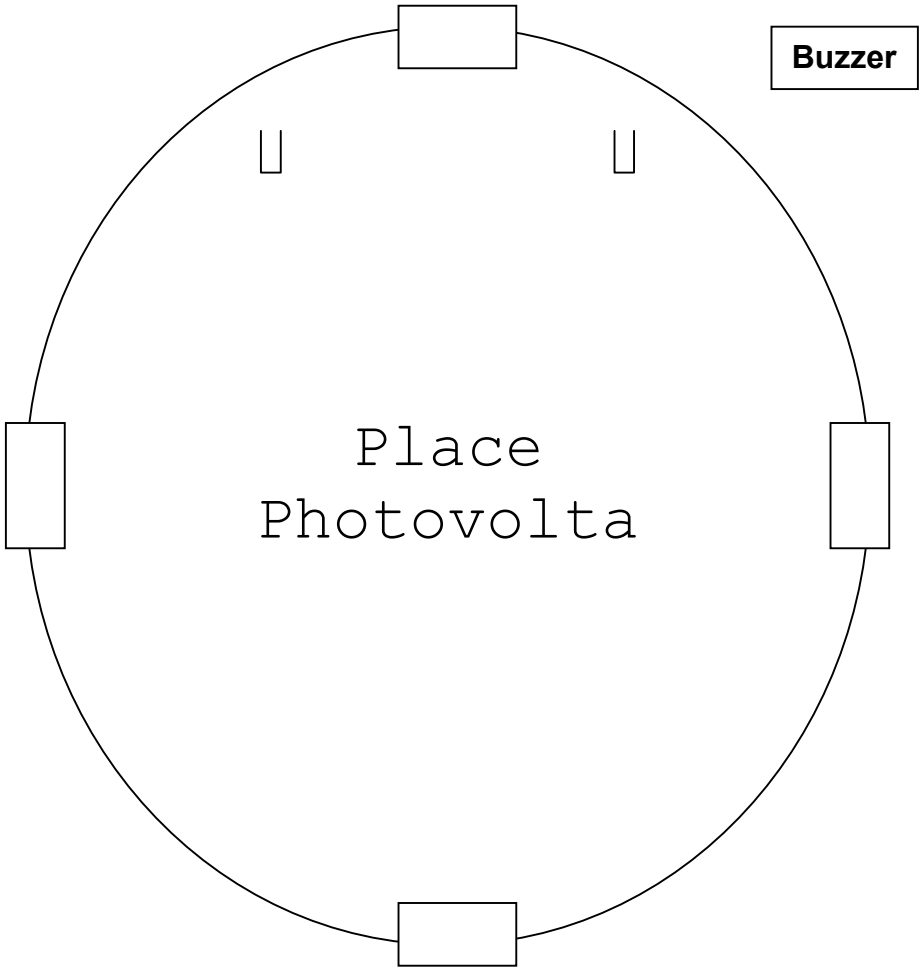
Trouble-shooting

If you do not hear the buzzer, check each of the following:

- Make sure the foil is connected properly on the back
- Make sure the questions are answered correctly
- Make sure the foil is smooth with no wrinkles or twists

Discovering Electricity
Quiz Board

TERM	DEFINITION
Battery	A device that measures how much electricity is used.
Electricity	A steady flow of electricity.
Meter	A very small electrical generator.
Circuit	A complete or unbroken path that allows electricity to flow.
Current	A type of energy that gives us heat, light, and power.



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Topic:	Geology
Objective:	Students will successfully complete reading one book: **The Magic School Bus** by Joanna Cole Students will travel on the Magic School Bus to learn about the different types of rocks.
ISBN:	0-590-40760-0
Reading Standards:	**Standard 1**: Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading; recognizing the concept of classic or enduring literature, and reading and listening to classic works.

Featured Fiction Book:

The Magic School Bus *Inside the Earth* by Joanna Cole

Summary

In **The Magic School Bus,** Ms. Frizzle takes her students to the center of the earth all the while learning about the different types of rocks and how they are made.

Suggested Questions to ask

What types of rocks are there? And how are they used?

There are 3 types of rocks - sedimentary, metamorphic and igneous. They can be used to make buildings, cement, roads and for decoration.

Where do rocks come from?
Most of the solid part of the earth is made of great masses of rock. The smaller rocks are pieces that broke off from the huge masses.

What are rocks made of?
Rocks are made of minerals. Sometimes you see tiny specks of different colors in a rock. These different specks are the different minerals that make up the rock.

What is the earth's crust?
The outside of the earth is a shell of hard rock and soil. This shell is called the earth's crust.

What is soil?
Soil is made of ground-up rock, mixed with clay, bits of dead leaves, sticks, and small pebbles. Without rock there would be no soil for plants and trees to grow in.

How are rock layers formed?
Millions of years ago, wind blew dust and sand into lakes and oceans. The dust and sand settled to the bottom in layers called sediment. Seashells formed layers of sediment, too.

How did fossils get in the rocks?
Sometimes a prehistoric plant or animal died and was buried in layers of mud, sand, or crushed shell. Then it turned to rock along with the layers. It became a fossil.

What are stalagmites and stalactites?
Shapes that look like cones and icicles are formed in caves by dripping water that contains tiny invisible bits of limestone. Stalagmites, G forms up from the ground and Stalactites, C forms down from the ceiling.

What are metamorphic rocks?
Rocks that are changed are called metamorphic rocks. They were changed from one kind rock to another kind of rock by heat and pressure.

What are igneous rocks?
Melted rock can push up through cracks in the earth's crust. When the melted rock cools and hardens, it is called igneous rock.

Is the center of the earth very, very hot or very, very cold?

The inner core is solid metal at 3000 - 6500 degrees, which is very, very hot.

What is inside the earth?
Under the earth's crust there are pockets of melted rock. Below this is the mantle, made of solid hot rock. The outer core is liquid metal and the very center of the earth, the inner core, is a ball of solid metal.

What is a volcano?
A volcano is an opening in the earth's crust where melted rock can flow out.

What are the three shapes of volcano?
There is a cinder cone, composite volcano and a shield volcano.

What is lava?
The material that comes out of a volcano is melted rock called lava. When lava cools, it hardens into new rock.

Is Styrofoam a type of rock?
No.

Vocabulary Words:

Note to Tutors:
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- monitor
- announce
- learn
- month
- challenge
- wonder
- excuse
- solid
- mass
- collect
- huge
- specks
- shiny
- dizzy
- spin
- shell
- crust
- soil
- clunk
- layers
- fossil
- sedimentary
- pressed
- crumbling
- sprouted
- icicles
- zoom

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Science Activity:	Rock Identification
Objective:	Students will successfully identify rock samples and describe characteristics of each rock sample.
Science Standard:	Standard 4.1: Students know and understand the composition of Earth, its history, and the natural processes that shape it. In grades K-4, what students know and are able to do includes: describing different types and uses of Earth materials (for example, rocks, soil, minerals, etc.); recognizing that fossils are evidence of past life.

Geology Activity – Rock Identification

Method
Students will identify different rock samples and write clues on identification cards to help them remember the different rock samples. They will place each rock in a cell of the rock collection box. They will be referencing **The Magic School Bus – *Inside the Earth book*.**

Materials Required

- "The Magic School Bus - *Inside the Earth*" Book
- Rock identification cards
- 15 cell rock collection box
- Clear plastic cup with water
- Paper clip
- Paper Towels
- Map (Colorado & the United States)
- 13 rock and mineral samples
  - Limestone
  - Marble
  - Shale
  - Shark Tooth
  - Trilobite
  - Granite
  - Slate
  - Sandstone
  - Basalt
  - Obsidian
  - Pumice
  - Fluorite
  - Pyrite
  - Talc

Procedure
We will refer to Ms. Frizzle's Magic School Bus – Inside the Earth's book to assist in the identification and classification of the rock samples. In the process the students will place the rock samples and identification cards into their rock collection box.

Before we get started with the rock identification activity we need to talk about the geology of Colorado. Rocks are everywhere!!!

Imagine millions of years ago, Cowell and all of Colorado was covered by water. The way that geologists know this is from the different layers of rock that they have uncovered and examined. There were also volcanoes and dinosaurs in Colorado. The mountains were formed when the land shifted upwards but there was also a time when parts of Colorado were very flat.

Rocks are used for many things. Houses may have sandstone walls and slate roofs. Office buildings many have granite walls. Statues may be made of marble. Today we are going to over a few samples of rocks and minerals.

1. Have the students **write their name** on the front of the rock collection box.
2. Remove all of the rocks from the plastic bag and place all of the rocks in the lid of the rock collection box.
3. Turn to page 15 in the Magic School Bus. What was the top layer of the earth's crust called? Soil or dirt
4. When the students in Ms. Frizzle's class starting using jackhammers, what rocks did they find?
   - Sedimentary
   - Sandstone
   - Shale
   - Limestone
5. What types of rocks are these? Sedimentary. Turn to page 17 in The Magic School Bus.
6. Have the students identify the sandstone rock sample. Pull the rock samples that look like they are made of grains of sand all pressed together in distinct banded layers. When you rub sandstone, it feels grainy. Which of your rocks feels grainy? This is the sandstone. The sandstone sample is from Fort Collins, Colorado. Locate this city on the Colorado map. Have them write clues on the rock identification card so they will remember sandstone. Have them place the sandstone in their box with the identification card.
7. Have the students find the shale sample. Shale is made of what? Page 18. Mud and clay pressed together. If shale is made of mud and clay, what color do you think it will be? Gray. Pull all of the rocks that are gray. Shale will smell muddy when it is wet. Put some water in your plastic cup and place the rock samples in the water. Smell the rock samples, which one

smells muddy? This is shale. The shale sample is from Grand Junction, Colorado. Locate this city on your map. Have them write clues so they will remember shale. Have them place the shale sample in their box with the identification card.

8. Have the students find the limestone sample. Limestone is made up of what? Page 19 - Shells pressed together. Limestone feels chalky. What color is chalk? White. Pull all of the white rocks. Find the rock that looks like shells pressed together. The limestone rock is from Texas. If there are shells in the rock what does that tell you about the environment of Texas years ago? There was a sea in Texas. Locate the state of Texas on the map of the United States. Have them write clues so they will remember limestone. Have them place the limestone sample in their box with the identification card.
9. Where have you seen limestone? Buildings and houses, chalk, cement, and fertilizer. What famous building in New York City is made of limestone? Empire State Building, page 22.
10. In sedimentary rocks you might be able to see fossils in the rocks. What is a fossil? A plant or animal that has died and was buried in the layers of the rocks and became fossilized as part of the rock.
11. Find the shark tooth fossil sample. Have them write clues so they will remember the shark tooth. The shark tooth is from Crawford, Colorado. Where do sharks live? In the ocean, rivers and lakes. This means that millions of years ago, Crawford was under water. Locate Crawford on the map. Have the students place the shark tooth sample in their box with the identification card.
12. The Magic School Bus went deeper into the earth where they found marble. What type of rock is marble? Metamorphic rock. Page 24.
13. What does metamorphic mean? “To change” Limestone + Heat + Pressure + Time = Marble
14. Find the limestone sample. What color is it? White. Pull all of the remaining white rocks. The marble sample is harder and heavier than the limestone sample. Take the paper clip and try to scratch the white rocks, you should **not** be able to scratch the surface of marble. Have you located the marble sample?
15. Where have you seen marble? Statues, monuments and buildings. The white marble is from Marble, Colorado. Locate this on your map. Have them write clues so they will remember marble. Have the students place the marble sample in their box with the identification card.
16. Another metamorphic rock is slate. The slate sample is harder than the shale sample. Look at your shale sample, what color is it? Gray. Separate the gray rocks. Pressure causes the minerals in slate to grow in parallel sheets, which makes slate split easily for roofing material. Which sample looks like separate sheets? The slate sample is from Pennsylvania. Locate the state of Pennsylvania on your United States map. Have them

write clues so they will remember slate. Have the students place the slate sample in their box with the identification card.

17. Where have you seen slate? Roofing tile, flagstones, and chalkboards. Slate is also used to trim the fronts and lobbies of buildings and for pool tables.
18. The Magic School Bus continued to travel further into the earth to find igneous rock. Page 26. What is an igneous rock? Igneous rocks are called fire rocks and are formed either underground or aboveground. Underground, they are formed when the melted rock, called magma, deep within the earth becomes trapped in small pockets. As these pockets of magma cool slowly underground, the magma becomes igneous rocks.
19. Now you need to find the granite sample. Not all granite is the same color, but all granite has crystals of quartz in it. Locate all of the rocks that have shiny specks? Not all of granite is shiny, just small portions. Granite is also opaque, which means no light goes through granite. Other rocks can be transparent where light can pass through the rock. Hold the rocks up to the light, can you see through them, if so, they are NOT granite.
20. What does your granite sample look like? Granite looks like a red, black and white speckled rock. Granite is a good building stone because it is very hard. Where have you seen granite? Buildings, monuments or curbstones. Granite is an excellent material for building bridges and buildings because it can withstand thousands of pounds of pressure. It is also used for monuments because it weathers slowly.
21. Have them write clues so they will remember granite. The granite sample is from Cañon City, Colorado. Locate this city on your map. Have the students place the granite sample in their box with the identification card.
22. The Magic School Bus is traveling to the inner core of the earth. Turn to page 28 of the Magic School Bus to see where the bus is traveling. The bus is coming out of the earth on a volcanic island.
23. What kind of volcano is the bus parked on? Cinder, composite or shield? Shield.
24. Igneous rocks are also formed when volcanoes erupt, causing the magma to rise above the earth's surface. When magma appears above the earth's surface, it is called lava. Igneous rocks are formed as the lava cools above ground.
25. Turn to page 31. Pumice rocks are igneous rocks that were formed when lava cooled quickly above ground. You can see little pockets of air in pumice. This rock is so light, that many pumice rocks will actually float in water. Check the weight of the remaining rocks, find the rocks that are light. Put the rock samples in the cup of water. Which one floated? This is pumice. The pumice is from New Mexico. Locate New Mexico on the map. If there is pumice in New Mexico, what geological event occurred? Volcano. Have them write clues so they will remember pumice. Have the students place the pumice sample in their box with the identification card.

26. What are some uses for pumice? Because the rock is so light, it is used quite often as a decorative landscape stone. It can also be ground up for scouring powders or can be used as a cosmetic stone for callus removal. Pumice is also used in kitty litter and for oil and chemical spill absorbent.
27. Basalt is the most common form of lava. Basalt has air spaces but is heavier than pumice. Find the rock that has air spaces, this is basalt. It is smoother than pumice and is a velvety-black or brown color. The basalt sample is from Grand Junction, Colorado. Locate this city on your map. If there is basalt in Grand Junction, what geological event happened here? Volcano. Have them write clues so they will remember basalt. Have the students place the basalt sample in their box with the identification card.
28. What are some uses for basalt? Building roads.
29. Obsidian is sometimes called volcanic glass. Obsidian is produced when the lava cools very quickly, so no crystals can form. Find the rock that has no crystals and looks like glass, this is the obsidian sample. It is shiny and has sharp edges. Have them write clues so will remember obsidian. The obsidian sample is from Utah. Locate this state on your map. At one time, there were volcanoes in Utah. Have the students place the obsidian sample in their box with the identification card. What are some uses for obsidian? Ancient people throughout the world have used obsidian to make arrowheads, knives, spearheads, and cutting tools of all kinds. Today, obsidian is used to make a scalpel used by doctors in very sensitive eye operations.
30. Turn to page 35 in the Magic School Bus and see how different rocks are used.
31. Look at the remaining rock samples and find the mineral sample that looks shiny like gold. It has a brassy yellow color. This is called pyrite and this rock fooled a lot of people in to thinking they found gold. Pyrite is called fools gold. Have the students write clues so they will remember pyrite. The pyrite sample is from Gilman, Colorado. Many people struck it rich in Colorado because they found silver and gold. Locate this city on the map. Have the students place the pyrite sample in their box with the identification card.
32. Find the mineral sample that has shiny green or purple crystals. The crystals are transparent, which means light can pass through it. This mineral is called fluorite. Where have you heard the word fluorite before? You have seen this rock in advertisements for toothpaste and as an additive to fluorinated water. That's right! Fluorite is used to brighten your teeth. Have the students write clues so they will remember fluorite. The fluorite is from Mexico. Have the students place the fluorite sample in their box with the identification card.
33. What do you think the mineral talc is used for? Pick up the last rock sample and rub your fingers on it. Does it feel soapy and soft? Talc can also be scratched easily. Take the paper clip and try to scratch the surface, it leaves lines on the surface. Talc is often used in products such

as talcum powder. Have the students write clues so they will remember talc. The talc sample is from Montana. Locate this state on your map. Have the student write clues so they will remember talc. Have the students place the talc sample in their box with the identification card.

34. You now have the beginning of a rock collection; there are a few empty slots for you to start collecting rocks on your own. Be sure to use the information you learned about rocks to determine what type of rock you collected.

Rock and Mineral Identification Cards

NAME: Shale **TYPE:** Sedimentary (formed by mud) **CLUE:**	**NAME:** Granite **TYPE:** Igneous **CLUE:**	**NAME:** Slate **TYPE:** Metamorphic (formed by shale) **CLUE:**	**NAME:** Sandstone **TYPE:** Sedimentary (formed by sand) **CLUE:**
NAME: Obsidian **TYPE:** Igneous (volcanic) **CLUE:**	**NAME:** Pumice **TYPE:** Igneous (volcanic) **CLUE:**	**NAME:** Fluorite **TYPE:** Mineral **CLUE:**	**NAME:** Marble **TYPE:** Metamorphic (formed by limestone) **CLUE:**
NAME: Sharks Tooth **TYPE:** Fossil (formed by limestone) **CLUES:**	**NAME:** Pyrite **TYPE:** Mineral **CLUES:**	**NAME:** Basalt **TYPE:** Igneous (volcanic) **CLUES:**	**NAME:** Limestone **TYPE:** Sedimentary (formed by shells) **CLUES:**
NAME: Talc **TYPE:** Mineral **CLUES:**	**NAME:** **TYPE:** **CLUES:**	**NAME:** **TYPE:** **CLUES:**	**NAME:** **TYPE:** **CLUES:**

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Topic:	Halloween
Objective:	Students will successfully complete reading one book: **Arthur's Halloween by Marc Brown.**
ISBN:	0-316-11059-0
Reading Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading.

Featured Fiction Book

Arthur's Halloween by Marc Brown

Summary
Arthur finds everything about Halloween scary, including his little sister's costume, his morning snack and the big house on the corner. He discovers who lives in the witch's house.

Suggested questions to ask

What costume did Arthur and DW wear for Halloween? Arthur wore a superman costume and DW was a devil.

What costume did the teacher wear? Mr Marco, the teacher was a giant robot.

Do you dress up for Halloween? If so, what will you be? Do you have to take younger brother or sister out for trick-or-treating?

What were the human eyeballs, hearts and brains made of? The eyeballs were peeled grapes, the hearts were Jell-o and the brains were cold spaghetti.

Why would none of the children go to the big house on the corner? They called the house the witch's house. Buster's brother saw someone go in there last Halloween and he never came out.

Who was the first one to go into the big house? Arthur turned around just in time to see DW disappear into the witch's house.

Did Arthur go after her? Arthur did but his hands turned ice-cold and his heart began to race.

Who did Arthur find inside the big house? DW and Mrs. Tibble having cider and chocolate donuts.

What did Arthur offer to do for Mrs. Tibble? Arthur said "Maybe if we help you fix up your yard the place won't look so spooky". On Saturday he helped rake the leaves.

Vocabulary

Note to Tutors
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- jumpy
- dim wit
- scientific
- recognize
- disappear
- cemetery
- attendance
- weird
-

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Topic:	Halloween
Objective:	Students will successfully complete reading one book: **The Headless Horseman adapted by Natalie Standiford.**
ISBN:	0-679-81241-5
Reading Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading; recognizing the concept of classic or enduring literature, and reading and listening to classic works.

Featured Fiction Book

The Headless Horseman adapted by Natalie Standiford

Summary

A superstitious schoolmaster, Ichabod Crane, falls in love with a wealthy farmer's daughter, Katrina Van Tassel. While he is courting Katrina, he has a terrifying encounter with a headless horseman.

Suggested questions to ask

Where do you think Sleepy Hollow is located in the United States? Have your student imagine what the village of Sleepy Hollow would look like and where it could be located.

Do you believe in ghosts? Have your student share any superstitions that he/she believes in. Ask your student if he/she has ever been spooked by a sound or something that they have seen?

Ask your student about how he/she would feel if they saw a headless horseman? If student seems interested, ask he/she to imagine how he/she would see or hear without a head?

Ask the student about Icabod's marriage plan. Do they think that Icabod will be successful in courting Katrina? Why?

What trick did Brom Bones do to Icabod? He broke into the school house and turned the tables and chairs upside down and made a mess of the school room. **Why did he do this to Icabod?** As a practical joke and he is also interested in Katrina Van Tassel.

When time did Icabod see the headless horseman? At midnight after the party at the Van Tassel's.

What did the headless horseman's head look like? Jack-o-lantern head

Where did Icabod need to go to be safe from the headless horseman? Icabod needed to cross the church bridge.

What happened to Icabod Crane? Nobody knows what happened, they found his hat by the church bridge and a smashed pumpkin next to the hat. Some townspeople think that the headless horseman carried Icabod away and his ghost now haunts the church bridge.

What ever happened to Brom Bones and Katrina Van Tassel? They got married.

What do you think happened to Icabod Crane? Do you think Brom Bones had anything to do with it? Why?

Vocabulary

Note to Tutors
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- drowsy
- dangling
- twirled
- shivers
- croaked
- hurled
- haunted
- squire
- horrified
- miserable
- hooted
- budge
- phantom
- topsy-turvy
- harvest time
- vanished
- clattered
- sap

Coalition for
Learning
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Tutors

Topic:	Light
Objective:	Students will successfully complete reading one book: **Day Light, Night Light** by Franklyn M. Branley.
ISBN:	0-06-445171-2
Reading Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading.

Featured Fiction Book

Day Light, Night Light by Franklyn M. Branley

Summary

Author introduces and explains different sources and uses of light in mostly everyday experience. Light is usually around us all the time, but sometimes it is in very small quantities so it seems "dark". Author describes how light reflecting off of surfaces enables us to see colors; mentions the moon and planets being visible as they reflect the sun's light; describes how very hot things often give off light and heat. The sun and stars do this, as does the small metal piece (filament) in a light bulb.

Suggested questions to ask

Where does most of our light come from? The sun.

How do we get sunlight indoors? Windows.

Do we have sunlight on very cloudy days? Yes, we can't see the sun directly, but any outside light during the day comes from the sun, it is just not as strong as direct sun.

Why don't we have sunlight at night? Where does the sun go? The sun does not go anywhere. The earth spins and Denver is on the part facing away from the sun at night.

Have you ever seen the moon? Where does the moon get its light from? It doesn't have any light of its own; it reflects light from the sun.

Is there light at night? Yes, just in very small amounts. If we can **see anything**, there **must be** light present.

How does a light bulb make light? The metal wire **(*filament)*** is heated to a very high temperature so it glows **(*radiates)*** light.

Vocabulary

Note to Tutors
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

shining	moonlight	streetlight
moonlight	bulb	bounces
reflect	campfire	shades
cave		

Coalition for
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Science Activity:	Making a Kaleidoscope
Objective:	Students will successfully make a kaleidoscope.
Science Standards:	**Standard 2.2:** Students know that energy appears in different forms, and can move (be transferred) and change (be transformed). In grades K-4, what students know and are able to do includes: recognizing that energy (for example, light, heat, motion, sound, mechanical) can affect common objects and is involved in common events.

Light Activity - Making a Kaleidoscope

Method
Students will make a kaleidoscope with the assistance of their tutor. Students will need some help in putting this together – it really takes 3 or 4 hands to hold the slides together and apply tape to make it into a prism.

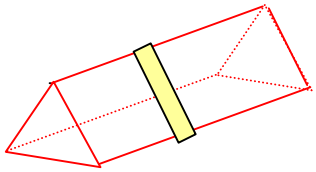
Materials Required
- 2 black film canisters
- Black electrical tape
- Transparent tape
- 3 Microscope slides
- 1 Tic-tac box (empty)
- 1 teaspoon transparent colored beads or sequins
- Hot glue gun
- Glue Sticks

Safety Tip
Only the tutors or designated adult will be using the glue guns. They are hot and we do not want anyone to get burned.

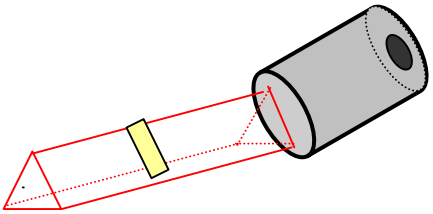
Procedure

1. Lay the 3 microscope slides side by side and place a small piece of **transparent tape** down the center across all three slides. Have the tape loosely fit across the slides or have a tiny gap between the slides when taping.

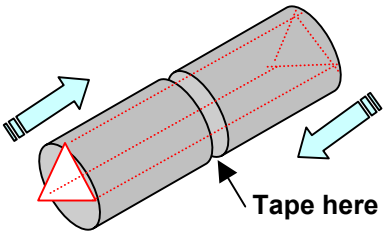
2. Carefully fold the slides into an equilateral triangle (all sides equal).



3. Slide the triangle of glass into the **uncut end of the film canister** (with the small hole) as far as it will go. You may need to gently squeeze the canister as you push the slides.

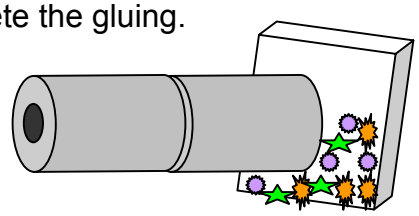


4. Place the other film canister over the exposed slides and push the two canisters together so the slides are inside the canisters. We want the smooth edges of each canister to be touching each other when we tape them. This is your kaleidoscope. Use the electrical tape to seal the two film canisters together and to prevent light from entering your kaleidoscope.



5. Look through the small hole on one end at objects around the room and describe what you see.

6. Fill the Tic-tac box ½ full of beads and /or sequins. Hot glue it over the open end of the kaleidoscope. Describe what you see. The tutor may need to help complete the gluing.



Students can slowly spin their kaleidoscope and see many transformations in color and shapes. Students should be able to observe twelve or more images (reflections) through their kaleidoscope.

Ask students to explain what they are seeing (it's OK if they are not quite sure). Light is reflecting off of the sides of the glass slides. Light bounces several times from one end of your kaleidoscope to the other.

Coalition for
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Topic:	Light
Objective:	Students will successfully complete reading one book: **The Rainbow and You** by E.C. Krupp.
ISBN:	0-688-15601-0
Reading Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading.

Featured Fiction Book

The Rainbow and You by E.C .Krupp

Summary
You will reveal the secrets of the rainbow with fascinating facts with dazzling illustrations. Roy G. Biv will guide you back in time to learn the importance of rainbows in ancient cultures. You'll also go inside a raindrop to discover how light bends to create the rainbows dazzling colors.

Suggested questions to ask

Is there really a pot of gold at the end of the rainbow? If not, what is a rainbows real treasure?
No. Its colors are its real treasure.

Why can't you touch or walk under a rainbow?
Because rainbows are not solid; they are actually light.

How many colors are there in the rainbow and what colors are they?
Seven. Red, Orange, Yellow, Green, Blue, Indigo, Violet.

What is a good way to remember the colors of the rainbow?
1. **R**un **O**nto **Y**our **G**old **B**efore **I**t **V**anishes.
2. ROY G. BIV

How did the rainbow get its name?
Because it is shaped like a bow and it only appears when it rains.

How is a rainbow created?
Sun + Rain = Rainbow
Whenever you look at a rainbow, the sun is behind you and the rain is falling in front of you in the distance.

What did the ancient Greeks believe?
That a messenger from the gods named Iris, flew along the rainbow's colorful bridge between heaven and earth and magically lifted water from the earth into the clouds causing it to fall as rain.

Who believed that a rainbow bridge connected Asgard, the sky kingdom of the high gods, with Midgard, the earth below?
The Vikings.

What did the Navajo of the American Southwest say about the rainbow?
The Monster Slayer and Born for Water, the twin hero sons of the sun, journeyed to their father's world by stepping onto the rainbow.

Explain what the people in Siberia said about the rainbow.
It was the storm god's bow and with it he shot arrows of lightning through the sky.

What do the Australian tribes know the rainbow as and what did they believe?
They knew it as the great serpent of the Dreamtime and they say that was the time when the world was created.

What does the rainbow signify in the Bible?
The end of the rain and God's promise that the world will not be destroyed again by flood.

Is black really a color? Why?
No, because we see black when there is no light and when there is no light, there is no color.

What are some other hues that sunlight can't put in the rainbow?
Browns and grays.

Who is Isaac Newton?
The scientist who explained the rainbow and discovered the law of gravity, which explains why raindrops fall. He also showed that sunlight is really made of the rainbow's colors.

What is white light and how was it discovered?
All the colors of the rainbow mixed together. Newton bent the sunlight with a prism and made a rainbow out of sunlight in a darkened room. Then he sent that rainbow through another prism and combined the colors back into white light.

How can raindrops spread sunlight into all the colors of the rainbow?
Water can bend light separating the colors as they bend in different directions as they enter the raindrop.

Which color of light bends the most? How about the least?
Violet bends the most and Red bends the least.

Why is each color in the rainbow headed in a slightly different direction?
Each color bends differently.

Explain how a rainbow is created.
The back of the raindrop works like a mirror. Inside the raindrop, most of the sunlight is bent and bounced back to the front of the drop where the light entered. The light is then aimed back toward the ground in the sun's direction.

What color is always on the outside of the arc when you see a single rainbow? How about the inside?
Red is on the outside and violet is on the inside.

How is a double rainbow created?
When some of the sunlight in a raindrop bounces twice before it leaves the drop.

What is the name of the world's largest natural arch? Where is it located?
Rainbow Bridge National Monument in the state of Utah.

Are both rainbows of a double rainbow the same?
No. The outer rainbow is fainter because a little light is lost with each bounce. The colors of the inner rainbow are reversed. Violet is on top and red is on the bottom.

How many raindrops create an entire rainbow?
Millions.

Can a rainbow be viewed as a complete circle?
Yes, from an airplane or a very high mountain.

How can you make your own rainbow?
By spraying a hose in front of you with your back to the sun.

Where else can see rainbow colors without the bow.
Oil on a puddle, CD's, soap bubbles, pearls and some shells.

Why is our world the only planet in the solar system where rainbows are possible?
Earth is the only planet with water on it.

Vocabulary

Note to Tutors
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- indigo
- effects
- bow
- ancient
- hues
- wedge
- prism
- rays
- eyewitness

Coalition for
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Science Activity:	Making a Solar UV Mosaic
Objective:	Students will successfully make a mosaic using Ultraviolet Light Detecting Beads.
Science Standards:	**Standard 2.2:** Students know that energy appears in different forms, and can move (be transferred) and change (be transformed). In grades K-4, what students know and are able to do includes: recognizing that energy (for example, light heat, motion, sound, mechanical) can affect common objects and is involved in common events.

Rainbow Activity – Making a Solar UV Mosaic

Method
Students will construct a mosaic with the assistance of their tutor.

Materials Required

- Ultraviolet Light Detecting Beads
  - Bag #1 (69 Orange)
  - Bag #2 (12 Purple)
  - Bag #3 (35 Blue)
  - Bag #4 (6 Red)
  - Bag #5 (10 Copper)
  - Bag #6 (48 Purple)
- 6” x 6” Mosaic Styrofoam Pattern
- Glue

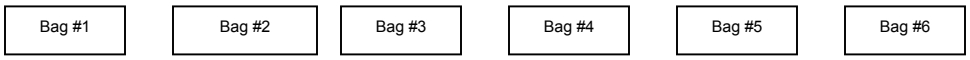
Procedure

1. Place the mosaic pattern in front of you with the numbers facing right side up.

```
11221122111
13333113333
14444554444
51115551116
66112211226
```

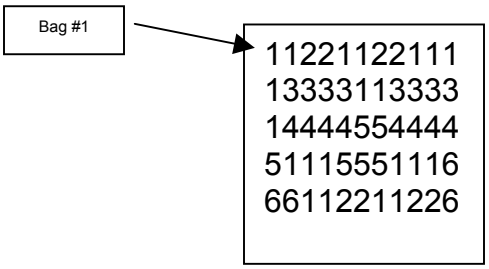
(This is just an example; it does not create an actual mosaic)

7. Put all six bags of beads where you can easily reach them making sure that you **DO NOT** mix any of the beads.

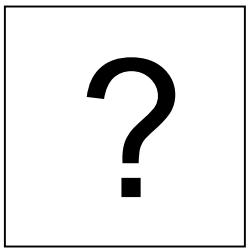


Note: THEY ALL MAY APPEAR THE SAME, BUT THEY ARE NOT.

8. Look at the first number on the mosaic pattern and grab a bead from the bag that has that same number on it.



9. Using a generous amount of glue, place the bead on the number and repeat the process for the remaining numbers.
10. After you are done gluing all of the beads to the mosaic pattern, allow your mosaic to dry for at least five minutes.
11. Once you have allowed your mosaic to dry for a little while, go outside and look at what you have created. What could it be? It's a surprise and you won't believe your eyes.



Why do the beads change colors?

The UV sensitive beads contain a pigment that changes color when exposed to ultraviolet light. The beads look identical when they are inside a building – they are all white. But, when you bring them out into sunlight and the ultraviolet rays of the sun hit the beads, they change color. The beads have been made with a special pigment so that they will change color in response to different wavelengths of light. Some beads will respond to "red" light, others will respond to "green" light or "violet" light. You will understand this better when you take your beads outside. Whenever the beads are "not" white, then you will know that ultraviolet light is present.

1	1	1	1	1	2	1	1	2	1	1	1	1	1	1
1	3	3	1	2	1	2	2	1	2	1	1	3	3	1
3	3	3	3	1	1	2	2	1	1	1	3	3	3	3
1	3	4	3	3	1	2	2	1	1	3	3	4	3	1
1	3	4	4	3	3	2	2	1	3	3	4	4	3	1
1	3	3	3	3	3	5	5	3	3	3	3	3	3	1
1	1	6	6	6	6	6	5	6	6	6	6	6	1	1
1	6	6	6	6	6	6	5	6	6	6	6	6	6	1
1	6	6	6	6	6	6	5	6	6	6	6	6	6	1
1	1	6	6	6	6	5	5	6	6	6	6	6	1	1
1	1	1	6	6	1	5	5	1	6	6	6	1	1	1
1	1	1	1	1	1	1	5	1	1	1	1	1	1	1

Coalition for
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Science Activity:	Making a Solar UV Bracelet
Objective:	Students will successfully make a solar-powered Ultraviolet bracelet.
Science Standards:	**Standard 2.2:** Students know that energy appears in different forms, and can move (be transferred) and change (be transformed). In grades K-4, what students know and are able to do includes: recognizing that energy (for example, light heat, motion, sound, mechanical) can affect common objects and is involved in common events.

Solar Color Activity – Making a Solar UV Bracelet

Method
Students will make a solar UV bracelet with the assistance of their tutor.

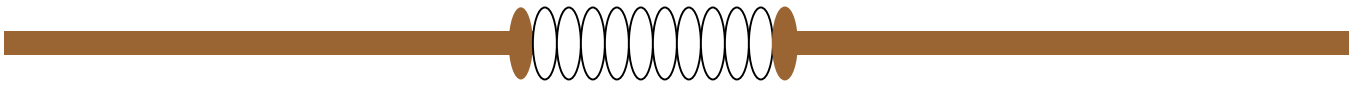
Materials Required

- 12 Ultraviolet Light Detecting Beads (variety)
- 13” Rawhide string

Procedure

1. Take the rawhide string and tie a knot about an inch off the center of the string.

2. Slip 10 of the beads through the long end of the rawhide until they meet the knot.
3. Tie another knot at the end of the last bead. This will keep the beads in place.



4. Now slip the last two beads through each end of the bracelet.

5. Take one end of the bracelet and slip it through the bead on the opposite end of the bracelet.
6. Do the same for the other end of the bracelet.
7. Once each end of the string has been slipped through the bead on the opposite side, tie a knot at the end of each string.
8. You now have an adjustable bracelet! Once you adjust your bracelet on your wrist, slip each bead to the edge of the knot to prevent your bracelet from adjusting on its own.
9. You are now ready to go outside to see what the ultraviolet rays from the sunlight will do to your beads.

Why do the beads change colors?

The UV sensitive beads contain a pigment that changes color when exposed to ultraviolet light. The beads look identical when they are inside a building – they are all white. But, when you bring them out into sunlight and the ultraviolet rays of the sun hit the beads, they change color. The beads have been made with a special pigment so that they will change color in response to different wavelengths of light. Some beads will respond to “red” light, others will respond to “green” light or “violet” light. You will understand this better when you take your beads outside. Whenever the beads are “not” white, then you will know that ultraviolet light is present.

Coalition for
Learning
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Tutors

Topic:	Light
Objective:	Students will successfully complete reading one book: **The Rainbow Fish by Marcus Pfister.**
ISBN:	1-55858-009-3
Reading Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading.

Featured Fiction Book

The Rainbow Fish by Marcus Pfister

Summary

A self-absorbed Rainbow Fish has very pretty scales, but no friends. The wise octopus tells him to give away his pretty scales and he will learn how to have friends. Reluctantly, the Rainbow Fish begins to give away his pretty scales to the other fish. Because he shared his prized scales with the other fish, they begin to accept him. Rainbow Fish learns that friendship is more important than pretty scales.

Suggested questions to ask

What color were Rainbow Fish's scales? Every shade of blue and green and purple, with some sparkling silver scales among them.

Did Rainbow Fish play with the other fish? No, he would just glide past, proud and silent, letting his scales shimmer.

What did the little blue fish ask Rainbow Fish? He asked, “Please give me one of your shiny scales. They are so wonderful and you have so many.”

Did Rainbow Fish give his one of his scales? No, he told the blue fish, “You want me to give you one of my special scales? Who do you think you are? Get away from me!”

What did little blue fish do? He told all the other fish what Rainbow Fish had said and none of them would have anything to do with him, they turned away when he swam by.

What happened to Rainbow Fish? He became the loneliest fish in the ocean.

What did the starfish tell him? Go beyond the coral reef to a deep cave and find the wise octopus. Maybe the octopus could help him.

How did the octopus know of Rainbow Fish’s story? The waves told her.

What did octopus advise Rainbow Fish to do? She told Rainbow Fish to give a glittering scale to each of the other fish and then he would learn to be happy.

Who did Rainbow Fish see next? The little blue fish.

What happened this time? Rainbow Fish gave little blue fish one of his shimmering scales.

How did the other fish react? They all wanted one of Rainbow Fish’s scales.

What did Rainbow Fish do? He gave each of the fish one of his glittering scales.

How did Rainbow Fish feel about giving away his scales now? The more he gave away, the more delighted he felt.

How many glittering scales did Rainbow Fish have left for himself? One.

Vocabulary

Note to Tutors
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- ordinary
- scales
- glide
- wonderful
- dazzling
- coral reef
- glare
- discover
- shimmery
- whizzed
- glimmering
- beautiful
- amazed
- shimmer
- shocked
- loneliest
- wise
- emerged
- advice
- bubbled
- flashing
- prized possessions
- sparkling
- rainbow
- followed
- special
- starfish
- octopus
- advice
- disappeared
- peculiar
- surrounded
- glittering

Coalition for
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Topic:	Martin Luther King, Jr.
Objective:	Students will successfully complete reading one book: **Martin Luther King Day** by Linda Lowery
ISBN:	0-87614-468-7
Reading Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading.

Featured Fiction Book

Martin Luther King Day by Linda Lowery

Summary
Briefly recounts the life of the black minister who devoted his life to civil rights and discusses the national holiday in his name: Martin Luther King Day celebrated on the third Monday of every January.

Suggested questions to ask

What happened on Monday, January 20, 1986?
This was the first time that Americans celebrated Martin Luther King, Jr.'s birthday as a national holiday.

Who was Martin Luther King, Jr.?
He was a black minister who fought for Civil Rights.

What did Martin Luther King, Jr.'s family and friends call him?
He was called M.L..

Why was suppertime such an important time while M.L. was growing up?
It gave the family a chance to share their ideas and feelings. Ask your student if his/her family talks about what happens during the day at suppertime.

What was one of the most important lessons in life that M.L. learned at the dinner table?
To treat all people with respect, no matter what the color of their skin was.

Why were white people and black people treated differently?
White and black people were treated differently because not everyone was taught the same - to treat all people with respect.

Why weren't M.L. and his best friend able to play together ever again?
His best friend was white and his parents didn't want their son to play with a black child.

What did M.L. want to do when he grew up?
He wanted to change things among people and teach them about respecting others.

How old was M.L. when he started college?
15. Ask your student if they would like to go to college someday. What would he/she like to study or like to be?

What job or profession M.L. decide to become in order to make the world a better place?
M.L. decided to be a preacher, like his father and grandfather.

Who was Mohandas Gandhi?
He was a man who showed the people of India peaceful ways to change the unjust laws of their government.

How did M.L. become known as Dr. King?
He attended school in Boston to become a minister and earned the degree and title of doctor.

Who did Dr. King meet while living in Boston?
He met a woman named Coretta Scott. They married on June 18, 1953.

Why did Mr. and Mrs. King move to Montgomery, Alabama?
Dr. King was asked to be the minister of a church in Alabama.

Why were the black people of Montgomery angry?
The black people were angry because of unjust laws and unequal treatment.

What was unfair about the bus law in Montgomery?
Black people had to sit at the back of the bus and give their seats up for the white people if the bus was full. Ask your student how he or she would feel about giving their seat up in a bus just because of the color of their skin.

What happened on December 1, 1955?
A black woman, by the name of Rosa Parks, refused to give up her bus seat after a hard day of work so she was arrested.

After this incident, Dr. King and other black leaders worked out a plan to change the unjust law. What was this plan?
To ask all black people to boycott the buses so that the bus company would lose money.

How long did this continue before the plan was successful in changing the unjust law?
They continued the bus boycott for one year.

What are Civil Rights?
Civil Rights ensure that all people receive equal treatment under the law.

What was Dr. King's dream?
Dr. King's dream was that little black boys and girls will be able to join hands with little white boys and girls and walk together as sisters and brothers.

What did Dr. King receive in December 1964?
Dr. King received the Nobel Peace Prize to recognize his peaceful work.

What happened in April 1968 to Dr. King?
He was assassinated in Tennessee.

Why do we celebrate Martin Luther King, Jr. Day?
It is a day that we take time to remember what Dr. King did to make our world a better place.

Vocabulary

Note to Tutors:
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- justice
- unjust
- assassinated
- national
- laws
- preacher
- minister
- arrested
- boycott

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Topic:	Martin Luther King, Jr.
Objective:	Students will successfully complete reading one book: **Martin Luther King, Jr.** by David Adler
ISBN:	0-8234-10847-7
Reading Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading.

Featured Fiction Book

Martin Luther King, Jr. by David A. Adler

Summary
A brief, illustrated, biography of the Baptist minister and civil rights leader whose philosophy and practice of nonviolent civil disobedience helped American blacks win many battles for equal rights.

Suggested questions to ask

When and where was Martin Luther King, Jr. born?
He was born on January 15, 1929 in Atlanta, Georgia.

How many brothers and sisters did M.L. have?
M.L. had one older sister and one older brother.

What did M.L. like to do when he was a child?
Play baseball, football, and basketball, ride his bicycle and sing. Ask your student what activities he or she likes to do.

Why were black people brought to America in chains many years ago?
They were brought here to be sold as slaves.

Why was Martin no longer allowed to play with some of his friends?
Martin was no longer allowed to play with some of his friends because of the color of his skin.

Could black people go to parks, restaurants, or even schools that had "White Only" signs posted? If not, why?
No, blacks could not go to parks, restaurants, or schools because it was against the law.

What kind of books did Martin read through his childhood?
Martin liked to read books about black leaders. Ask your student, what kind of books he or she likes to read.

Why did Martin's followers want to fight the white people?
They were upset because someone threw a bomb into Martin's house while he was at a meeting.

Did Dr. King encourage them to fight?
No. He told them to go home peacefully because they must meet hate with love.

What happened in 1963?
Dr. King led the biggest march of all; The March on Washington.

What happened in 1964?
Dr. King was awarded the Nobel Peace Prize.

What happened with the laws shortly after?
New laws were passed and blacks were allowed to go to the same places as whites.

Why was Dr. King in Memphis, Tennessee?
He was in Tennessee to march for equal pay for black and white garbage workers.

Who was James Earl Ray?
He was the man who assassinated Martin Luther King, Jr. in April 1968.

Martin Luther King, Jr. dreamed of a world free of hate, prejudice and violence. What was carved on his gravestone?
"I'm free at last."

Vocabulary

Note to Tutors:

These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- slaves
- riots
- prejudice
- protest
- laws
- preacher
- character
- assassinated
- boycott

Coalition for
Learning
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Topic:	Owls
Objective:	Students will successfully complete reading one book: **ANIMAL LIVES: The Barn Owl** by Sally Tagholm.
ISBN:	0-7534-5171-9
Reading Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading.

Featured Non-Fiction Book

ANIMAL LIVES: The Barn Owl by Sally Tagholm

Summary
The book chronicles a year in the life of a barn owl. Discover where the owls live, which creatures they hunt, and how they find a mate. Then see how and where the owl builds its nest, hatches its eggs, and feeds it young. The Barn Owl is one of nature's most graceful creatures, sometimes called a screech owl or a monkey-faced owl.

Suggested questions to ask

How does the owl catch his prey?
He flies above his prey and then suddenly he plunges, snatching his prey, folding it in to the viselike grip of his deadly claws. He flies off with his catch hanging from his beak.

Do owls have teeth to chew their food?

No. They swallow their prey whole.

Where do Barn Owls make their nests?
You can find their nests in abandoned buildings, barns, church towers, and holes in trees.

How does the mother owl turn the eggs?
At regular intervals she stands up and turns the eggs to make sure they are heated evenly, pushing them around with her face and bill.

What special thing does a baby chick have to help it break out of the egg?
There is a special bump on top of his beak - an egg tooth - to help hem push his way out of the shell.

Are baby chicks born with feathers?
They are born blind and helpless, with scrawny pink bodies and no feathers. The chick's bodies are soon covered with fluffy white down.

What does the owl eat?
They feed on small mammals, particularly voles, as well as rats, shrews, mice, frogs, and small birds.

When do owls hunt for food?
Owls usually hunt at night. Owls normally keep out of sight during the day and fly at night to hunt. They roost in quiet, undisturbed places during the day.

What does brooding mean?
When a bird is brooding it is sitting on the eggs to keep them warm and help them hatch.

What is an owl pellet?
The pellet is a dried mass of undigested food that has been regurgitated. It consists of tiny bones, feathers and fur of the animals that it has eaten.

When an owl is preening, what is it doing?
They are trimming and cleaning their feathers with their beak.

When a baby chick is fully feathered and able to fly it is called?
Fledged.

Vocabulary

Note to Tutors
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- ghostly
- super-efficient
- hovers
- scamper
- deserted
- plump
- viselike
- acrobats
- phantom
- flock
- triumphantly
- preen

Coalition for
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Science Activity:	Dissecting Owl Pellets
Objective:	Students will successfully dissect an owl pellet to learn what the owl has eaten.
Science Standards:	**Standard 3.1:** Students know and understand the characteristics of living things, the diversity of life, and how living things interact with each other and with their environment. In grades K-4, what students know and are able to do includes: distinguishing living from nonliving things; classifying a variety of organisms according to selected characteristics (for example, backbone vs. no backbone); describing the basic needs (for example, food, water, air, shelter, space) of an organism; giving examples of how organisms interact with each other and with nonliving parts of their habitat. **Standard 3.2:** Students know and understand interrelationships of matter and energy in living systems. In grades K-4, what students know and are able to do includes: recognizing that green plants need energy from sunlight and various raw materials to live, and animals consume plants and other organisms to live; recognizing the interrelationships of organisms by tracing the flow of matter and energy in a food chain.

Owl Activity – Dissecting Owl Pellets

Method
Students will dissect owl pellets, reconstruct prey skeletons and identify prey. Tutors will need to assist the students so this activity can be finished in the allotted time.

Materials Required

- Owl Pellet
- Probe
- Metal Forceps
- Styrofoam Plate
- Disposable Gloves and Rubber Bands
- Glue
- Student Worksheet and Guide
- Owl Pellet Bone Identification Sheets
- Ziploc baggie
- Magnifying glass or hand lens to look at teeth

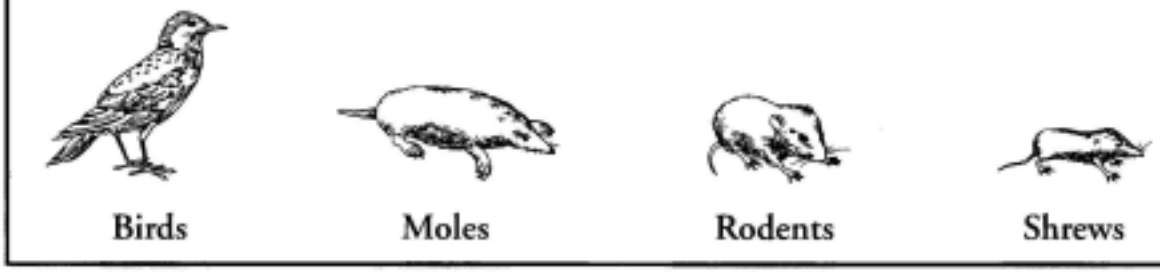
Note: The magnifying glasses, forceps, and probes must be returned to the program coordinator at the end of the activity.

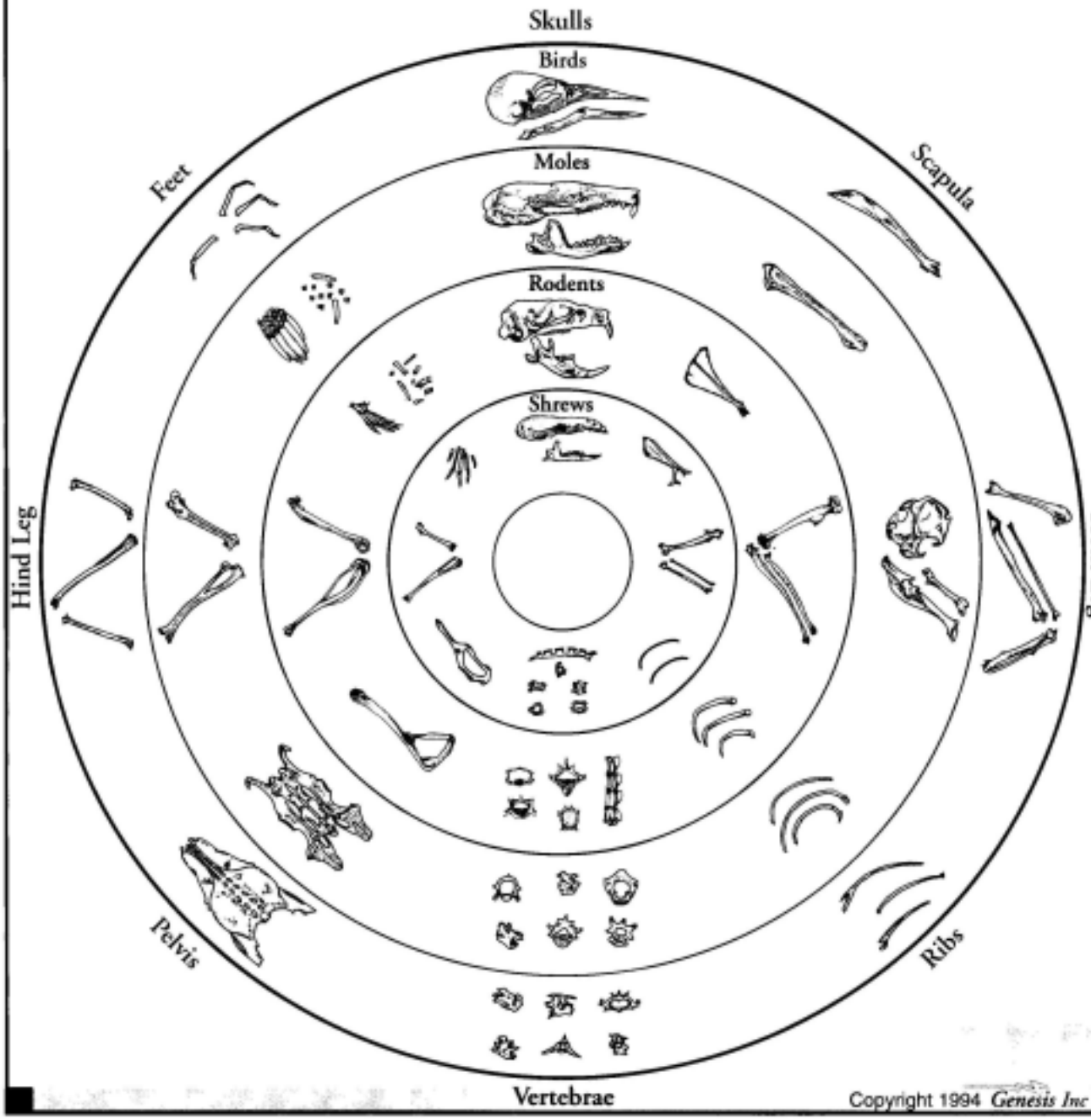
NOTE to Tutors
If you approach this as a wonderful, exciting opportunity to do real science, your students will feel the same way. If you act squeamish, your student will be hesitant to participate in this activity.

Procedure
1. Distribute owl pellets and supplies to each student. Assist the students in putting on the plastic gloves and securing the gloves with rubber bands around their wrists. Have the students remove the owl pellet from the piece of foil.
2. Review safe lab procedures including the need to wash hands before and after doing the activity and the importance of not eating or drinking during the activity.
3. On the Styrofoam plates, have the students observe the pellet and record its color and size in their Owl Pellet Study Kit Student Worksheet and Guide in their notebook.
4. Have the students separate the bones from the fur and feathers with the probe and forceps. Some of the bones are very fragile, so be careful. Keep the fur and feathers on the Styrofoam plate for identification purposes.
5. Have the students place the bones and skulls on the card stock.
6. Have them refer to their Student Worksheet and Guide and Owl Pellets Bone ID Sheet to assist in the identification of the prey species. Assist the students in the process of elimination of identifying the bones, skull, fur and feathers.
7. Separate skulls and jaws to assist in species identification.
8. Teeth can be critical for the identification of the prey species. Use a magnifying glass to look at the teeth.
9. Assist the students in observing the teeth. Refer to the chart of "Key to Mammal Skulls and Remains Commonly Found in Owl Pellets." Consider the following: How are the teeth arranged? Are the teeth designed to tear flesh, grind seeds or eat plants? Using the teeth as a guide, the students can determine what kinds of food the prey species most likely ate.
10. Determine if there are bones from more than one animal in the pellet. If there are, determine how many and what type.
11. Lay out the bones to form as many complete skeletons as possible. Skeletons may be glued on to the card stock paper for display and labeling.
12. Have the students fill in the results of their observations in their notebook and answer the Summary Questions.

If there is time, have the students complete the food chain that includes the owl, its prey, and what the prey eats.

Owl Pellet - Bone ID Sheet





Owl Pellet Dissection - Shrew Bone Identification Sheet

Skull

Vertebrae

Scapula

Pelvis

Front Legs

Hind Legs

Ribs

Feet

Owl Pellet Dissection - Rodent Bone Identification Sheet

Skull

Vertebrae

Scapula

Pelvis

Front Legs

Hind Legs

Ribs

Feet

Owl Pellet Dissection - Mole Bone Identification Sheet

Skull

Vertebrae

Scapula

Pelvis

Front Legs

Hind Legs

Ribs

Feet

Owl Pellet Dissection - Bird Bone Identification Sheet

Skull

Vertebrae

Scapula

Pelvis

Front Legs

Hind Legs

Ribs

Feet

Coalition for
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Topic:	Rainforests
Objective:	Students will successfully complete reading one book: **Bringing the Rain to Kapiti Plain** by Verna Aardema
ISBN:	0-14-054616-2
Science Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading.

Featured Fiction Book:

Bringing the Rain to Kapiti Plain by Verna Aarkema

Summary:

Bringing the Rain to Kapiti Plain is a Kenyan folktale of the Nandi people. Ki-pat is a cow-herder in the rich, lush Kapiti Plain. The Kapiti Plain has not received any rain this year. The grass is brown and dead, the cows are hungry and thirsty, and other animals have migrated away from Kapiti Plain in search of water. Even though there is a dark cloud overhead, it will not drop rain. An eagle provides a feather for an arrow that Ki-pat makes. He shots his arrow into the cloud and rains return to Kapiti Plain.

Suggested questions to ask

Where is Africa? Kenya? Have your student find both on a map. Discuss continent vs. country. Compare latitude (horizontally across the map or around the globe) with Colorado and other places your student knows or has visited.

What is a "Plain"? Do we have them in the United States? Have you seen one? Basically, anything east of Denver is a plain – the beginnings of the Great Plains, in fact.

Can you find a picture of an 'acacia tree' in the story? The sun is rising over an acacia tree on the first page.

Different kinds of animals live in the plains compared to the mountains – what kind of animals (used to) live in the Great Plains? There used to be millions of buffalo that lived in the Great Plains. There are also antelope, pronghorns, coyotes. Horses did not come until the white settlers brought them from Europe.

Why did Ki-pat need a feather to put on the end of his arrow? A feather helps to steady (or stabilize) the arrow while it is in flight. Without it the arrow would wobble in flight.

Do you think the eagle dropped his feather on purpose to help Ki-pat bring rain to Kapiti Plain?

Vocabulary Words:

Note to Tutors:
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- Acacia trees
- giraffe
- creatures
- herdsmen
- pasture
- belated
- migrated
- drought
- shadowed
- mooed
- stork
- feather
- thong
- pierced
- loosed

Coalition for
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Topic:	Rainforests
Objective:	Students will successfully complete reading one book: **The Great Kapok Tree** by Lynne Cherry.
ISBN:	0-15-200520-x
Reading Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading.

Featured Fiction Book

The Great Kapok Tree by Lynne Cherry

Summary

The Great Kapok Tree - a tale of the Amazon rain forest. In the dense, green Amazon rain forest, a man is chopping down a great Kapok tree. The animals that live among its leaves and branches watch him silently. Hot and weary, the man lies down to rest at the foot of the tree and falls asleep. Then, one by one, the forest creatures emerge to whisper in his ear. They beg him not to destroy their home and tell him how important every tree is in the rain forest.

Suggested questions to ask

What is a Kapok tree?

It is a very tall tree that emerges above the canopy of the rain forest.

What is the canopy of the rain forest?
The tops of the trees in the rain forest are called the canopy. The canopy is a sunny place that touches the sky.

What is the bottom of the rain forest called?
The bottom of the rain forest is called the understory. The animals that live in the understory like darkness.

What was the man doing in the rain forest?
He was going to cut the tree down.

What kinds of creatures live in the Kapok tree?
Snakes, butterflies, monkeys, tree porcupines, frogs, anteaters, bees, birds, and well as jaguars, anteaters, and a three-toed sloth's.

Are there any people in the rain forest?
The Yanomamo tribe live in the rain forest. A child from the tribe also spoke to the sleeping man.

What would happen to the rain forest if all the trees were cut down?
"The roots of the trees will wither and die, and there will be nothing left to hold the earth in place. When the heavy rains come, the soil will be washed away and the forest will become a desert."

Do jaguars live in the Kapok tree?
Yes. "A jaguar had been sleeping along a branch in the middle of the tree." His spotted coat blended in with the tree because of the light and the shadows of the rain forest.

What do animals and humans need in order to live?
Oxygen.

Do trees produce oxygen?
Yes, "If you cut down the forests you will destroy that which give us all life."

What did the man see when he woke up?
He saw the rain forest child, and all the creatures that depend upon the great Kapok tree.

Did the man chop down the tree?
No, he hesitated and then he dropped the ax and walked out of the rain forest.

Vocabulary

Note to Tutors
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- canopy
- understory
- ancestors
- lulled
- slithered
- pollinate
- chattered
- wither
- ruins
- piped
- dappled
- padded
- howling
- hum
- hissed
- gash
- destroy
- unstriped
- leapt
- clinging
- plodding
- amidst
- dangle
- suspended
- Senhor
- steamy
- emerges
- squawking
- pollen
- smoldering

Coalition for
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Topic:	Rainforest
Objective:	Students will successfully complete reading one book: **The Rainstick** - ***A Fable*** by Sandra Chisholm Robinson
ISBN:	1-56044-284-0
Reading Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading.

Featured Fiction Book

The Rainstick – *A Fable* by Sandra Chisholm Robinson

Summary
A boy embarks on a quest to bring back the sound of rain to his West African village. Includes a discussion of how rainsticks are used today and instructions for making a rainstick.

Suggested questions to ask

What was the boy dreaming about? About a big feast that would appear whenever beating upon a magical drum. Ask your student if he/she has ever had a dream that seemed real.

Why was the boy looking up at the sky? He was looking for rain clouds because he wanted it to rain.

Who was both a leader and the rainmaker of the village? The boy's father.

Why were the people of the village angry with the rainmaker? No rain had fallen for a long time.

Describe the climate of the village. The sun was hot, the winds were dry, and the river no longer flowed.

Who was the storyteller? He was an old man of the village who knew many things and shared his stories of the different places he had seen. Ask your student if he/she knows somebody who shares stories with them.

What did the storyteller put into the hand of the boy? A pouch that contained a perfect blue feather from a bird that lives in the place of rain.

What did the storyteller want the boy to do? Go to the place of rain where the sky and the earth come together and bring the sound of rain back to the village. Ask your student if he/she would be scared if they were asked to go on a journey like this.

What does "many suns" mean? Many days.

What did the heat do to the boy? It caused him to see things that really weren't there. Ask your student if they know the word that describes this illusion.

Where did the boy sleep the night he saw the vision of his mother? Up in a baobab tree. Ask your student if he/she would like to sleep up in a tree.

Why did the boy and his people refer to the baobab tree as the upside-down tree? The branches are twisted and they look like roots.

What was at the base of the tree when the boy woke up the next day? Lions.

What are some of the things the boy ate on his journey? Eggs, fish, fruit…… Ask your student what he/she thinks of some of the stuff the boy ate.

What was the climate like once the boy got further away from the village? Water and food were more abundant and the grass grew thicker, greener and taller.

Why didn't the boy enter villages that he saw on his journey? He was a stranger.

What did the boy see from atop the mountain? A forest -*The place of the rain.*

How did the boy feel when he entered the forest? Scared. His heart was pounding, he was short of breath, and he couldn't even spit because his mouth was dry. Ask your student if he/she has ever felt like this.

Describe what the forest looked like.

Describe the noises that the boy heard when he laid down to sleep. Ask your student what he/she would do in that situation.

What awoke the boy when he was taking a nap in the forest? The distinct call of a bird.

Why did the boy follow the bird? Because the bird had the same feathers as the one in his pouch.

Where did the bird lead him? To a village where there was lots of laughter and happiness.

When the boy decided to go into the village, what did he find? A straight tube that made the sound of rain when it was tipped. A rainstick.

What would the boy take back to his village? The sound of rain and stories of the place that the rain visited.

What did the storyteller mean when he said that a slender staff touches earth and sky at the same time? The slender staff that touches earth and sky is the rain.

Vocabulary

Note to Tutors
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- jostling
- thatched
- calabash
- quarreling
- cowered
- acrid
- sternly
- baobab
- rejoiced
- strewn
- tendrils
- horizon
- gouged
- raucous
-

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Science Activity:	Making a rainstick.
Objective:	Students will successfully make a rainstick.
Science Standards:	**Standard 2.2:** Students know that energy appears in different forms, and can move (be transferred) and change (be transformed). In grades K-4, what students know and are able to do includes: recognizing that energy (for example, light heat, motion, sound, mechanical) can affect common objects and is involved in common events.

Rainforest Activity – Making a Rainstick

Method
Students will construct a rainstick with the assistance of their mentor.

Materials:

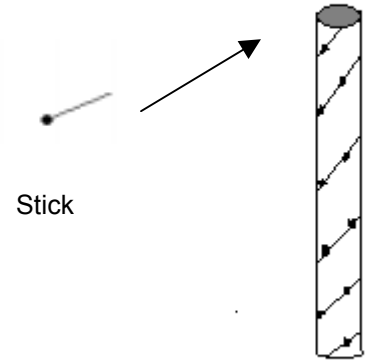
- One cardboard tube with pre-drilled holes
- 9 x 6 mm beads
- Pre-cut wooden dowels or lollipop sticks
- Glue
- Masking tape
- "Fill" (rice, pebbles, dried beans, shells, beads, etc.)
- Two circles of paper stock
- Decorating Materials:
  - Paint
  - Yarn

Procedure

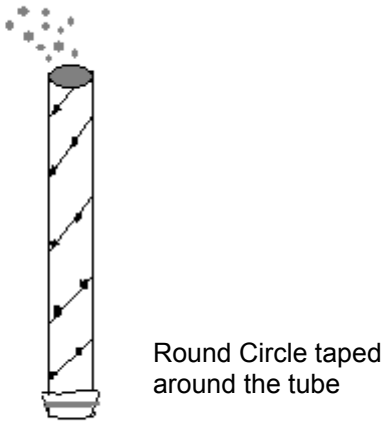
1. Distribute cardboard tube and supplies to each student.
2. Take all of the materials out of the large Ziploc bag and put them in front of you.
3. Starting with the first hole on the crease of the tube, push a stick through the hole to the other side. You may need to look through the center of the

cardboard tube to use the light as a guide to push the stick through the hole to the other side.

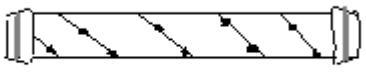
4. After you get the stick through the cardboard tube, glue a bead onto the end of the stick and continue doing this for the remaining holes. **It is best to follow the crease of the tube.**



5. Once you have finished putting all the sticks through the holes, put one of the round circles at either end of the cardboard tube and tape the edges of the circle around the tube.
6. Pour about half a cup of "fill" into the open end of the tube and cover it with your hand.



7. Invert the tube slowly and listen to the wonderful sound that is made.
8. Discover the various sounds that can be made with your rainstick by experimenting with different types of "fill" and the amount used.
9. Once you determine which "fill" you like the best, pour it into the tube and put the other round circle at the open end of the tube and tape the edges down.
10. Wahlah! You are now ready to decorate your rainstick! You can paint the cardboard or wrap yarn around the ends. Be creative and have fun!



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Topic:	Sun
Objective:	Students will successfully complete reading one book: **Sunshine** by Joy Palmer**.**
ISBN:	0-06-445019-8
Reading Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading.

Featured Non-Fiction Book

Sunshine by Joy Palmer

Summary

Sunshine is a book about the sun. It explains the facts about the sun, how we measure with it, how we use sunshine, how plants use it, how we make electric power from the sun.

Suggested questions to ask

What would happen to earth if we did not have the sun's energy? The earth would have no life or light.

Why are some areas on earth warmer or colder than others? The North and South poles receive less energy from the sun because the sun's rays are spread out over a larger area of the earth's surface.

How does the tilt of the earth affect the weather here? The part of the earth tilted towards the sun experiences summer, while the part of the earth tilted away from the sun experiences winter.

How does the sun help plants? The sun provides plants with sunlight which they use to make food through photosynthesis.

How does the atmosphere work? The atmosphere acts like a blanket keeping in the warmth of the sun.

How has pollution affected the ozone layer? Pollution has started attacking the ozone layer and making holes in it. The holes will allow some of the sun's harmful rays to get through the atmosphere.

What do we call people who study the weather? We call them meteorologists.

What device did people use the sun for thousands of years ago? A sundial used the sun so people could tell what time it was.

What do people near the equator do to keep cool? They wear loose, light clothing to help keep them cool.

What happens to plants because of the sun? They take in water from their roots, the water moves up the stem and into the leaves. It then evaporates from the leaves.

What is solar energy used for? It can be used to heat buildings and provide hot water. It can also be used to produce electricity.

What is a heat wave? A heat wave occurs when hot, dry sunny weather lasts for many weeks.

Vocabulary

Note to Tutors
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- sphere
- solar system
- curved
- tilts or tilting
- depends
- photosynthesis
- shortage
- tropical
- atmosphere
- ozone layer
- pollution
- meteorologists
- evaporate
- cope
- melanin
- air conditioning
- borrow
- hover
- solar energy
- unpredictable
- heatwave
- shields

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Topic:	Sun
Objective:	Students will successfully complete reading one book: **The Sun** by Paulette Bourgeois**.**
ISBN:	1-55074-330-9
Reading Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading.

Featured Non-Fiction Book

The Sun by Paulette Bourgeois

Summary

The Sun is a book about the sun. It explains the facts about the sun, has experiments, things to make and stories and legends about the sun. It explains where the sun came from, what it is made of, and how it effects the planet earth.

Suggested questions to ask

Is the Sun a star or a planet?
The Sun is a star - a bright, big, ball of burning gas.

How old is the sun?
The Sun is 4 1/2 billion years old.

Is the Sun a small, medium or large star?
Stars come in all sizes anywhere from dwarf to giant size. The sun is a medium-sized star. Scientists call our Sun a yellow dwarf.

What does the Sun do?
The sun gives us light and heat.

How does the Sun make rain?
The Sun's heat gives us rain. The Sun warms lakes and oceans and some of the water changes into a gas called water vapor. The water vapor floats high in the sky and when chilled it changes back to water. When the water drops get too heavy they fall as rain.

How does the Sun make wind?
The Sun's heat also gives us wind. The heat warms the air and when air is warm, it moves. And wind is moving air.

What is the Sun made of?
It started as an enormous cool cloud of gas and dust. It became smaller and hotter until it started to shine.

What does solar mean?
Solar means "about the sun".

Should you look at the sun directly? Why not?
The sun's light is very, very bright and could damage or burn your eyes or even make you blind.

What are sunspots?
Sunspots are cooler spots on the sun. Some of those spots are bigger that the Earth.

What is a sun flare?
A sun flare is a super powerful burst of energy from the surface of the sun.

What is the path a planet takes around the sun called?
It is called its orbit.

How long does it take for the Earth to go around the Sun?
Earth takes 1 year, or 365 days and 6 hours to make one orbit.

What is the shortest day of the year called?
It is called Winter Solstice. It occurs on December 21st every year. On the winter solstice, the earth is leaning as far away from the Sun as possible. This day we have the fewest hours of daylight than any other day.

What is the longest day of the year called?
It is called the Summer Solstice. It occurs on June 21st every year. On that day we receive more hours of daylight than any other day because we are the closest to the sun as possible.

How did the Egyptians tell time?
The sundial is a clock that uses the Sun to tell time. The pointer on the sundial casts a shadow onto a disk that has lines marked on it. These markings tell what time it is.

What is an eclipse?
Sometimes the Sun, Moon, and Earth line up in a straight line with the Moon in the middle. The Moon blocks the Sun's light from reaching Earth and a solar eclipse occurs.

What color is sunlight?
The sunlight you see every day looks white but it is really a mixture of seven different colors: red, orange, yellow, green, blue, indigo, and violet. (**ROY G. BIV**).

Where is the ozone?
About 25 miles above the Earth there is a thin layer of a gas called ozone. One the most important things ozone does is stop too much UV light form reaching Earth.

What is solar power?
Solar power is power we get from the Sun. We use the Sun's energy to warm buildings, heat water and make electricity.

Vocabulary

Note to Tutors
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- ancient
- reflect
- sundial
- secrets
- zoom
- shadow
- swallowed
- helium
- pointer
- gravity
- emptiness
- dwarf
- waves
- scratched
- discovers
- prepare
- rainbow
- Milky Way
- core
- arranged
- boil
- especially
- prism
- shrink
- weather
- scattered
- dimmer
- hemisphere
- horizon
- midday
- ultraviolet
- presses
- equator
- magnetic
- hydrogen
- equinox
- rays
- oxygen
- machines
- eclipse
- water vapor
- different
- appears
- chilled
- seasons

Coalition for
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Topic:	Sun
Objective:	Students will successfully complete reading one book: **The Sun *Eye On The Universe*** by Niki Walker.
ISBN:	0-86505-692-7
Reading Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading.

Featured Non-Fiction Book

The Sun *Eye On The Universe* by Niki Walker

Summary
This book describes the characteristics of the Sun, covering such topics as its creation and physical make-up as well as its effects on Earth.

Suggested questions to ask

What is the Sun and how far away is it from Earth?
The Sun is a star which is about 93 million miles away from Earth.

What is a star?
A huge ball of gas that glows and gives off heat.

What does the Sun do for the Earth?
It provides the Earth with light and heat, which makes it possible for every living thing to eat, breathe, and grow.

What is the Milky Way?
The Milky Way is our galaxy, which is made up of billions of stars.

Why should you never look directly at the Sun, even if you are wearing sunglasses?
Looking at the sun can seriously damage your eyes or even cause blindness.

Is the Sun bigger than the Earth?
Much bigger. If the Sun were an empty container, you could put more than a million Earths inside it.

How many different types of stars are there? List them.
Four. White dwarf, yellow dwarf, red giant and blue giant.

What does a star's color depend on?
How hot it is. It's like heated metal; it first glows red, then yellow, and finally it becomes white-hot.

There are different stages of a stars life. What do stars start off as?
They start off as nebulas.

What is the solar system made up of?
The Sun, nine planets, moons, comets, asteroids, meteoroids, and all the dust and space between them.

How many planets are there in our solar system? List them.
Nine. Inner planets: Mercury, Venus, Earth and Mars. Outer planets: Jupiter, Saturn, Uranus and Neptune. Pluto.

Does the Sun have a firm surface like Earth does?
No. It is made up entirely of gases.

The Sun is made up of several distinct layers. What is the center of the Sun called and what is created in this area?
The center of the Sun is called the core and huge amounts of energy is developed there.

Which layer of the Sun is a thin blanket of gas that glows pink? Which is the layer we see?
The chromosphere. We see the photosphere.

What are the gases inside the Sun made up of?
Atoms.

How many natural types of atoms are there and what determines its type?
There are 92 types of atoms and the number of protons it has determine its type.

When is the Sun considered to be in an active period?
When sunspots are at their maximum.

What is a sunspot?
Dark splotches on the surface of the Sun that are cooler than the rest of the surface.

What are the "northern" and "southern lights"?
They are auroras, which are shimmering beams of light that can be seen in the sky around Earth's North and South Poles.

Explain how the Sun's energy is moved along the food chain.
First, plants absorb sunlight and store the energy to make food. Next, an animal eats the plant getting the energy stored inside. Then, another animal eats the animal that ate the plant getting the energy stored inside of that animal.

Why is solar power an important resource?
It will last much longer than other energy sources and does not pollute the air and water.

What do solar panels do and how do they work?
They create heat and hot water for buildings and houses. They are mounted on the outside of the house or building so that the black lining can absorb the Sun's heat. The heat warms cold water flowing through a pipe inside the panel, and the water then flows out of the solar panel to be used in the building or house.

How long does it take the Earth to make one full trip around the Sun?
One full year.

How were people able to tell the time many years ago before watches and clocks were invented?
By using a sundial. The Sun's rays shine on the sundial from different angles as it moves through the sky. The time is determined by where the shadow falls.

What creates the different seasons on Earth?
Changes in sunlight. When the northern hemisphere is tilted toward the Sun, it is summer in that part of the world. When the northern hemisphere is tilted away from the Sun, it is winter.

What is an equinox and when does it occur?
It's a day when there are equal amounts of daylight and darkness. It occurs on the first day of spring and on the first day of autumn.

When does a solar eclipse occur?
When the Moon comes between Earth and the Sun and blocks the Sun from our view.

What is a total eclipse?
When the Moon blocks the Sun completely only leaving the corona visible.

During an annular eclipse you can still see the Sun's photosphere. What does annular mean?
Ring.

How can we see the spectrum, which is all the seven colors that make up light?
By bending or refracting it by passing through different substances such as air, water or glass.

Why does sunlight refract when it travels from one material into another?
The new substance causes it to either speed up or slow down.

Why is the sky blue?
Sunlight gets scattered by dust and air particles in the atmosphere and blue, indigo and violet light are affected more than the other colors. They get scattered around the atmosphere so the sky appears blue to us. The violet and indigo light are almost impossible to see.

What is the atmosphere?
A layer of air surrounding the Earth that gets thicker the closer it gets.

What are the fan-shaped beams of light that shoot out from the Sun called and how are they created?
Crepuscular rays. They are created when sunlight filters through clouds in the sky.

Vocabulary

Note to Tutors
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- galaxy
- gravity
- nebulae
- hydrogen
- supernova
- asteroids
- meteoroids
- orbit
- elliptical
- compressed
- opaque
- corona
- photosphere
- granules
- chromosphere
- radiate
- atoms
- protons
- neutrons
- electrons
- nucleus
- fusion
- ion
- fuse
- helium
- deuterium
- equator
- axis
- sunspots
- splotches
- flares
- auroras
- solar winds
- plasma
- borealis
- australis
- photosynthesis
- vapor
- condense
- solar collector
- solar panels
- orbit
- sundial
- hemisphere
- solstice
- equinox
- umbra
- penumbra
- spectrum
- refract
- interface

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Science Activity:	Building a Solar Pizza Box Oven
Objective:	Students will build a pizza box solar oven and make solar S'mores.
Science Standards:	**Standard 2.2:** Students know that energy appears in different forms, and can move (be transferred) and change (be transformed). In grades K-4, what students know and are able to do includes: recognizing that energy (for example, light heat, motion, sound, mechanical) can affect common objects and is involved in common events.

Solar Energy Activity – Building a Solar Pizza Box Oven

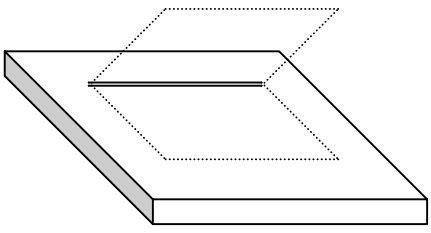
Method
Students will build a Pizza Box Solar Oven and cook S'mores.

Materials:

- 1 pizza box
- Masking tape
- Scissors
- 3 sheets Black construction paper
- Clear plastic wrap
- Aluminum foil
- Clothes hanger prop
- Black paper plate

Procedure:

1. Fold the cardboard into its boxed shape.
2. Gently fold the flap on the top of the lid back along the uncut edge to form a crease.



3. Wrap the underside (inside) face of this flap with aluminum foil (shiny side out). Tape it so that the foil is held firmly but that there's not too much tape showing on the foil side of the flap.
4. Open the box and cover the entire bottom of the box with black construction paper using tape to secure it. (make sure that no tape is exposed)
7. Cut plastic wrap an inch larger than the lid opening on the box top. Tape it on the underside of the lid opening. Add another piece of plastic wrap to the top of the lid opening. This creates a layer of air as insulation that keeps heat in the box. BE SURE THE PLASTIC WRAP IS TIGHT.

8. **YOU ARE ALMOST DONE!** Set the oven at an angle facing the Sun. Use the prop to keep the flap of the box open and adjust it so the most amount of sunlight is striking the oven window.

9. **Now you are ready to make S'mores.** Prepare your S'more, place it on the plate provided, and put it in the center of your pizza box solar oven making sure that the lid is closed tight. Heat up and enjoy!

The S'more Recipe

Ingredients:

- Graham crackers
- Chocolate bar
- Marshmallow

Break graham cracker in half. Place a marshmallow on 1/2 of the graham cracker. Put chocolate on top of the marshmallow. Cook and place other 1/2 of graham cracker on top before eating.

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Topic:	Thanksgiving
Objective:	Students will successfully complete reading one book: **Albert's Thanksgiving by Leslie Tryon.**
ISBN:	0-689-82072-0
Reading Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading.

Featured Fiction Book

Albert's Thanksgiving by Leslie Tryon

Summary

In Albert's Thanksgiving we see him build a table for the feast, growing flowers and vegetables, harvesting the garden, cooking and helping with Patsy Pig's extra chores. All of these things need to be completed in order to be ready for the Thanksgiving feast.

Suggested questions to ask

What animal is Albert? Albert is the white duck with the blue apron.

What item does Albert build? He builds the feast table.

Why is Albert doing all the chores? Everyone else is too busy with their own schedule.

What were the children making for the feast? The children were busy working on their pilgrim hats and Indian headbands. Do you make anything special for Thanksgiving at your house?
What was Albert going to make for the feast? Albert had promised to make his scrumptious pumpkin pizza pie. Do you like pumpkin pie?

What was the last chore that needed to be done before the feast? The vegetables had not been harvested yet. Patsy and all the children helped pick the vegetables for the feast. Does your family have a garden?

What kind of Thanksgiving feast do you have? Do you have a lot of family at your house? What kind of food does your family serve?

If you had your choice would you rather be a pilgrim or an Indian? This question was just for thought.

Vocabulary

Note to Tutors
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- harvest
- interrupted
- firepit
- exhausted
- feast
- precut
- scrumptious
- costume
- carpenter
- pilgrim
- magnificent
- PTA (Parent Teacher Association)

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Topic:	Thanksgiving
Objective:	Students will successfully complete reading one book: **Arthur's Thanksgiving** by Marc Brown.
ISBN:	0-316-11232-1
Reading Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading.

Featured Fiction Book

Arthur's Thanksgiving by Marc Brown

Summary
Arthur finds his role as director of the Thanksgiving play a difficult one, especially since no one will agree to play the turkey.

Suggested questions to ask

What was the name of the Thanksgiving play? The Big Turkey Hunt.

Ask your student if he/she have ever been in a play? Ask what the play was about and his/her role.

Who was picked as the director of the play? Arthur.

Why was everyone being so nice to Arthur at lunch? His classmates wanted Arthur to pick them for certain parts in the play so they were bribing him with food and toys.

What part did Francine want? Narrator.

Why did she get the role? She has the loudest voice.

Who got the part of Governor Bradford? Buster.

What part in the play is Arthur having a hard time filling? Turkey.

What actions did Arthur do to try and get someone to play the Turkey? He tried to get his dad, mom and sister to play the turkey. He also made an announcement over the schools public address system for a turkey. He also played an ad in the school paper and put posters up in the cafeteria.

What was Buster's line in the play? What is wrong with what he is saying? "In 1620, we sailed to America on the cauliflower". The name of the ship was Mayflower.

What are some of the foods that the pilgrims and Indians ate at the dinner? Turkey, beans, pumpkin pies, corn bread, and cranberries. **Share with your student what you eat on Thanksgiving and ask he/she what they eat for Thanksgiving.**

Ask your student what he/she thinks is the most important part of Thanksgiving.

Since no one wanted to be the turkey, what did Arthur try to do? Rent a turkey.

Who ended up being the turkey? Arthur.

Vocabulary

Note to Tutors
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- grumbled
- narrator
- glamorous
- intelligent
- cauliflower
- performance
- fumbling
- disaster
- symbol
- vomitrocious
- desperate
- rehearsals
- auditorium
- assign
- director
- squealed
- appointment
- pilgrims
- rejoicing

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Topic:	Thanksgiving
Objective:	Students will successfully complete reading one book **The Squirrels' Thanksgiving** by Steven Kroll
ISBN:	0-590-10837-9
Reading Standard:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading.

Featured Fiction Book:

The Squirrel's Thanksgiving by Steven Kroll

Summary:

What do a brother and a sister have to be thankful for? Each other. This Thanksgiving story has a message of thankfulness. The squirrel family reflects on how thankful they are for the many things they have. This is even more evident after the way their cousins treated them at Thanksgiving dinner.

Suggested questions to ask:
What are the names of the main characters in the story? Momma and Poppa squirrel and their two children, Buddy and Brenda.

Why was Buddy unhappy with his sister? His sister was lagging behind them on their walk and she dropped all her nuts on the ground and she put big marshmallows on the sweet potatoes instead of the little one.

Why was Brenda unhappy with her brother? He knocked the acorns off the table and he got glue in her fur.

What nice things did Buddy do for his sister to show he was thankful? In the morning he let his sister go into the bathroom first. He also let her sit in the front seat of the car on the way to church.

What nice things did Brenda do for her brother to show she was thankful? When she went down for breakfast she poured him a bowl of cereal.

Were the cousins well behaved? No. They stepped on Buddy's toe, and elbowed Brenda in the ribs. They put a pawful of nuts down Buddy's shirt and pulled Brenda's tail.

What kind of things are you thankful for? Food for thought for the student.

Do you have relatives or friends over for Thanksgiving dinner? Tutor can share their traditions for Thanksgiving.

Vocabulary Words:

Note to Tutors:
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- jumpy
- recognize
- attendance
- dim wit
- disappear
- weird
- scientific
- cemetery

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Topic:	Weather
Objective:	Students will successfully complete reading one book: **Hurricane** by David Wiesner.
ISBN:	0-395-62974-8
Science Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading.

Featured Fiction Book:

Hurricane by David Wiesner

Summary:

Hurricane is an entertaining story that mixes preparation before, loss of power during, and the consequences of a violent storm – a hurricane. The main characters, David and George, go out and enjoy many imaginary adventures using the massive elm tree which was felled during the storm.

Note to Tutors:
If your student has completed the featured book, encourage him/her to continue reading with one of the supplemental books listed below or you can have a discussion about some of the topics that came up in the story, such as: the worst storms your student has ever been in, preparations they or their family make at home for bad storms, playing imaginary games, etc..

Suggested questions to ask:

Have you ever been in a hurricane? What was it like? Have you ever been in a tornado or seen one? What was it like?

What was David's cat's name? Hannibal.

Where did David and George find Hannibal? Hannibal was sitting outside the storm door that had been taped to prevent the window from shattering in the storm.

Would the hurricane winds be strong enough to blow Hannibal away? Yes, the radio broadcast said sustained winds of fifty miles per hour were expected with gusts up to ninety miles per hour.

Why did the lights go out? An electric power line probably went down due to the storm.

Have you ever lost electric power where you live? What did you do?

What do squirrels and birds do during storms? Squirrels usually hole up in their tree. Birds can get blown all over the place by a storm and end up thousands of miles away from home.

What did the boys find the next morning after the storm? A big elm tree on Mr. Wilbur's land had fallen to the ground.

Who was the leopard on the boys jungle safari? Their cat, Hannibal.

What did David search for while riding the seven seas? Pirate ships.

Where did the boys go the next day? They journeyed to the stars and beyond.

What happened to their adventure tree a couple of days after that? Men came and cut up the tree using chainsaws.

Later that afternoon, another storm was rolling in. What did the boys hope for? They hoped that the storm would knock over the tree in their own yard so they could play more and they wouldn't have to worry about their tree getting cut up and hauled away.

Vocabulary Words:

Note to Tutors
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- groceries
- securing
- peered
- thoroughly
- indignant
- sustained
- blizzard (green)
- creaking
- eye of the hurricane
- Atlantic Ocean
- neighbor
- jungle
- safari
- climbing
- fearlessly
- expedition
- stalking
- leopard
- horizon
- pirate
- journeyed
- adventure
- chainsaw
- miserable
- surviving
- rumbled

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Topic:	Weather
Objective:	Students will successfully complete reading one book: **Storm in the Night** by Mary Stolz.
ISBN:	0-06-443256-4
Science Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading.

Featured Fiction Book:

Storm in the Night by Mary Stolz

Summary:

While sitting through a fearsome thunder-storm that has put the lights out, Thomas hears a story from Grandfather's boyhood, when Grandfather was afraid of thunderstorms. This book has very demonstrative illustrations that will help to explain the story. It also includes lots of 'typical' grandfather-grandson dialogue.

Suggested questions to ask

Do you have a grandfather(s)? What is his name(s)? Where does he live?

Why can we hear better when it is dark? Because you are listening and not trying to see and hear at the same time

What was Thomas's cat name? Ringo

What was Grandfather's dog name? Melvin

What part of the house did the Grandfather tell his story? By the light of the lightning, they make their way to the front door and out on the porch.

What types of weather can be in a storm? Lightening, thunder, rain, and wind.

What did Thomas and Grandfather do when the lights can on? They turned them off and went to bed.

What would you do if the lights went out and you were all alone at home?

Vocabulary Words:

Note to Tutors:
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- bough
- clap
- thunder
- wiggle
- shivering
- exactly
- admire
- babbling
- repeats
- scared
- except
-

- faucet
- frighten
- tale
- fluttering
- flickers
- shadows
- silliness
- daintily
- brandishing
- whooped
- believed
-

- clattered
- rumble
- memory
- creaking
- dove
- mutterings
- pups
- interrupting
- patter
- sprinkling
-

Coalition for
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Topic:	Weather
Objective:	Students will successfully complete reading one book: **The Big Storm** by Bruce Hiscock.
ISBN:	0-689-83265-6
Reading Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading.

Featured Non-Fiction Book

The Big Storm by Bruce Hiscock

Summary

How did one storm cause so much damage? And where did it come from? This book explains how big storms are created, and how they travel, with illustrations and simple diagrams of weather patterns. Once you know the story of this big storm, you'll never look at a rainy day the same way again.

Suggested questions to ask

When did the big storm start?
The last day of March in 1982.

What season is a time of rapidly changing weather?
Spring.

What part of North America did the big storm start?
The west.

What did the clouds bring to the Pacific Coast?
Heavy rain.

What are the westerlies?
The winds that nearly always blow from west to east across North America.

Where is the Sierra Nevada Mountain range and what does "Sierra Nevada" mean in English?
It is located in California and "Sierra Nevada" means "Snowy Mountains".

What happened in the Sierras (short for the Sierra Nevada Mountains) when the storm reached them?
The rain mixed with the cold air and changed to snow.

What caused the avalanches in the Sierras?
Deep drifts of snow near the mountaintops that slid down the mountains.

What did the storm bring when it reached Colorado?
Fierce winds that reached 141 miles per hour, overturning vans and campers.

What is the line where warm and cold air masses bump called?
A front.

What happens in a cold front?
The cold air mass pushes against the warm air mass causing high winds and possible violent weather.

Where does the power of weather come from?
The sun.

What is the thin layer of air called that surrounds our planet? What is it made up of?
The atmosphere. It is a mixture of gases, clouds, and dust.

What causes the atmosphere to flow and swirl around the Earth changing the weather?
Heat from the sun.

How is a breeze created?
Warm air rises and cool air flows in along the ground to take its place.

How does the land and sea affect the weather?
The ocean currents cool or warm the air and hills and mountains block the wind. The spinning of the earth also changes the wind's direction.

What happened to the big storm when it swept over the Great Plains?
It grew worse and formed a deep low-pressure center.

What does a barometer measure?
It measures the pressure of the air directly overhead.

What happened to the barometer readings in the Great Plains?
They fell to record low levels.

What is the force of air pressed down on the earth called?
Barometric or atmospheric pressure.

How do the changes of barometric or atmospheric pressure help forecasters predict the weather?
High pressure usually brings fair skies and low pressure means storms.

What data is sent to the computers at the National Meteorological Center near Washington, D.C.?
Weather data from weather stations, satellites, and instrument-carrying balloons.

What do the computers at the National Center do with the data?
They give an overall picture of the weather forecast and predict what the weather will be like across the country.

What happens in areas of low pressure?
Enormous amounts of air are pushed upward causing air near the ground to rush in from all sides.

What can powerful cold fronts produce?
Violent thunderstorms and tornadoes.

What were police and other spotters watching for in Texas on April 2nd?
Tornadoes.

What is a tornado?
Violent whirlwinds and funnel-shaped clouds that spiral down from thunderstorms.

What happened when the tornado hit Paris, Texas?
It ripped a path through the city two blocks wide and five miles long destroying houses, churches, trees and tossing cars around.

How many tornadoes hit the states of Texas, Oklahoma, Arkansas, Missouri and other states on April 2nd and 3rd?
More than 80.

What place has the most tornadoes than anyplace else in the world?
The United States.

How is a tornado formed?
Dense air pushes in, forcing the warm, moist air to rise very quickly producing strong updraft winds that begins to spin and suck in anything in its path.

What did the big storm bring to Alabama and Georgia? How about Kentucky?
Heavy Rain. Hail the size of golf balls.

What are rain and hail formed from?
The moisture in clouds.

When do hailstones form?
When an ice crystal is coated with freezing cloud mist.

How do hailstones get bigger?
When they are lifted again and again by strong updrafts, becoming coated with many layers of ice before dropping from the cloud.

How is lightning created?
By all the motion of ice and water inside a cloud building up an enormous charge of static electricity and then releasing its energy in millions of volts.

What usually comes after the lightning and how is it created?
Thunder. It is created by the waves of air that expand after being heated by the electric discharge.

What happened for the next three days?
A huge mass of Arctic air behind the cold front brought more snow and high winds to the Midwest.

How many travelers were stranded in Michigan and where did they spend the night?
500 were stranded and they had to stay the night in school gyms.

What happened on opening day for the baseball season on Tuesday, April 6th?
There was the first blizzard ever to hit New York City in April and the Yankees game was delayed for four days.

The big storm is just a memory now but every spring the cycle repeats itself. Why?
Because warm air from the south meets with cold Arctic air, triggering storms of all sizes.

Vocabulary

Note to Tutors
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- satellite
- inland
- westerlies
- continent
- drifts
- slopes
- avalanche
- powerhouse
- blizzards
- front
- masses
- tremendous
- atmosphere
- current
- barometer
- forecasters
- predict
- meteorological
- forecast
- data
- humid
- rumble
- whined
- churning
- billowing
- eerie
- spotters
- broadcast
- horrendous
- outbreak
- wedge
- dense
- updraft
- hail
- drenched
- moisture
- mist
- static
-

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Science Activity:	Constructing a Model Tornado
Objective:	Students will construct a model tornado with the assistance of their tutor.
Science Standards:	**Standard 2.2:** Students know that energy appears in different forms, and can move (be transferred) and change (be transformed). In grades K-4, what students know and are able to do includes: recognizing that energy (for example, light heat, motion, sound, mechanical) can affect common objects and is involved in common events.

Weather Activity – Constructing a Model Tornado

Background:
We will do several activities that will lend insight into how real tornadoes actually work! We will need lots of water and things may get a little messy, so we will work outside.

Activity #1

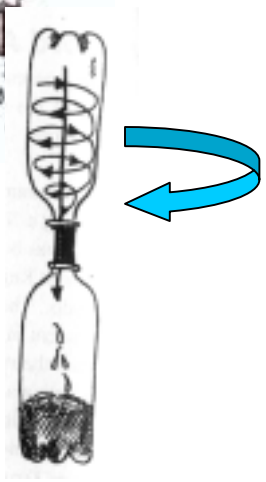
Materials:

- 2 empty, plastic, 2-liter soda bottles
- 1 watch with a second hand (your own or your student's watch is fine)
- 1 marker
- 1 tornado tube 
- time chart
- pencil
- water
- 1/8 cup of vegetable oil

Procedure:
1) Fill the bottle ¾ full (or a bit more) with water
2) Use your marker to mark exactly where the water line is
3) Twist on the **tornado tube** – be sure that it is tight

4) Have your student turn the bottle upside down while you time how long it will take for the bottle to empty. He/she should have the bottle upside-down and vertical, the water will chug out as small bubbles of air replace the water inside the bottle. If the water stops coming out completely, have him/her shake the bottle lightly to get the water to continue to come out. **NOTE:** Be sure to have the student pour over the ground or somewhere where it is OK for the water to pour.

5) Record the time to pour out all of the water
6) Now remove the tornado tube and fill the bottle with water to the same line
7) Twist on the **tornado tube** – be sure that it is tight. Twist another 2-liter bottle to the other end of the tornado tube.
8) With the bottle upright (vertical), have your student move it rapidly in a circular motion so that the water begins to collect on the outer wall of the bottle.



9) While continuing with the circular motion, begin your stopwatch and have him/her turn both bottles upside-down and continue with the circular motion until a vortex is started. Once the vortex begins, he/she can simple hold the bottles steady and the vortex should continue until the top bottle is empty.
10) Record the time
11) Compare the results
12) What happened? Why?

Part 2
Procedure:

1) Now remove the tornado tube and fill the bottle with water to just below the same line as before
2) Add in 1/8 cup of vegetable oil
3) Twist on the **tornado tube** – be sure that it is tight. Twist another 2-liter bottle to the other end of the tornado tube.
4) With the bottle upright (vertical), have your student move it rapidly in a circular motion so that the water begins to collect on the outer wall of the bottle
5) While continuing with the circular motion, begin your stopwatch and have him/her turn both bottles upside-down and continue with the circular motion until a vortex is started. Once the vortex begins, he/she can simple hold the bottles steady and the vortex should continue until the top bottle is empty.
6) Record the time
7) Compare the results
8) What happened? Why?

Tornado Tubes Time Chart

Method	Time #1	Time #2	Observations

Conclusions:

_____
_____
_____

Background Information on Tornadoes and Hurricanes

Tornadoes and hurricanes are similar in that both are associated with thunderstorms - violent atmospheric combinations of wind and water.

Tornadoes occur over land and are formed within a thunderstorm. Tornadoes are much smaller than hurricanes, but have much stronger winds.

Hurricanes form over an ocean by combining many thunderstorms. When a hurricane passes over land, it can start a tornado.

A vortex is a type of circular motion that causes liquids and gasses to travel in spirals around a centerline. A vortex will continue its rotating action naturally until something occurs to disrupt it.

Vortices (plural of vortex) form in many ways. One common way a vortex forms is in your bathtub or sink where gravity is the force that pulls water down through a hole creating a vortex.

Vortices can form in water or air when two streams flow against each other. Water down your sink is an example of air and water as the two streams flowing – water takes the place of air in your pipes and air takes the place of water in your sink.

Occasionally, you might see a small vortex around a home or building that is swirling leaves or other debris. These vortices are commonly called 'dust devils'.

Tornadoes

Tornado facts

The word '**tornado**' comes from the Spanish word '***tornada***' which means '**thunderstorm**'.

If a tornado travels over water, it funnels up water, rather than debris, and is called a **'water-spout'**.

The violent, rotating winds of a tornado are the **strongest winds on earth**. They form a high speed vortex rotating around a region of low atmospheric pressure and temperature. The winds in a tornado spiral upwards and can pull up dirt, trees, and other objects right off the ground and into the '**funnel**'.

- It is very difficult to get inside a tornado to measure its wind speed. Estimates for weak tornadoes wind speed are approximately 115 mile per hour (mph). For strong tornadoes, wind speed estimates are **300 mph or more!**

- Most tornadoes are between 100 and 600 yards wide.

- The average tornado path is 4 miles long.
- 600 - 900 tornadoes touch down in the U.S. in a typical year.

How tornadoes are formed
The conditions required to start a tornado often occur in the Central and Midwestern United States in the spring and summer. It takes warm, moist air drifting north from the Gulf of Mexico and combines it with cool air travelling southward from Canada. The cool air moves towards the ground while the warm, moist air rises. As the warm air rises, it begins to cool and condense forming water droplets and large cumulonimbus clouds (know as thunderheads). The ground is hot from the sun and the cool air moving in becomes heated from the ground and begins to rise in columns of air known as updrafts. If the heated air is not able to rise right away because of the cool air moving in, the heated air begins to build up pressure. When the heated air finally breaks through the cool air, the updraft can be very rapid and may even start to spin or rotate. The **rotating updraft** is a **vortex**. If the rotating updraft extends throughout the thunderhead, it is called a **mesocyclone**. If the mesocyclone extends below the thunderhead, it is called a **funnel cloud**. If the funnel cloud extends all the way down to the ground, it is called a **tornado**.

Hurricanes

Hurricane facts
The word **'hurricane'** comes from the West Indian word **'*huracan*'** which means **'big wind'**.

A hurricane occurs when many large thunderstorms come together over ocean water and begin to swirl like a vortex. If the storm occurs on **the Atlantic or the eastern Pacific Oceans**, it is called a **hurricane**. If it occurs over **the western Pacific or Indian Oceans**, it is called a **'taifun'** (typhoon) or **'great wind'**.

- The strongest winds in a hurricane occur near (40-60 miles) its center, in the **'eye wall'**.
- The center of the hurricane is a cloud-free, low pressure area that is characterized by complete calm.
- The energy from a hurricane comes from the heat released when water vapor condenses to liquid water.
- If you stayed in the same place as a hurricane approached, you would see dark clouds coming with wind speeds increasing and lots of rain and hail as it got closer and closer. The winds would be most severe when the **eye wall** reached you. Suddenly, the winds would die down and the sky would lighten leading you to believe the storm had passed, but you are merely in the **eye of the hurricane**. As the hurricane continued to pass over you, the winds would pick up again (the **eye wall**) as would the rain and hail, but now the winds

would be coming from the other direction as the wind completes its big 'circle' as part of a vortex!

- A hurricane is typically 300 miles wide. The tropical storm it is within may be 2,000 miles wide.
- Hurricanes tend to lose energy and intensity when they travel over land or over cool water
- Hurricanes last from several days to a week or more
- Hurricanes can drop as much as 24 inches of rain in a 24-hour period!
- Names for hurricanes are assigned in alphabetical order and alternating between male and female names

How hurricanes are formed

Hurricanes form near the equator where water temperatures are above 80 F continuously and the air is hot. The heat (from the sun) evaporates water and makes the air very moist and warm. Ocean winds blow warm air masses in many directions, when they meet it is called a convergence. When warm air masses collide, the air at the center begins to rise, forming an updraft. When the air rises enough, it begins to cool due to altitude and it forms droplets and clouds (thunderstorms). As thunderstorms begin to gather together, they are called a tropical disturbance. If many more thunderstorms join the disturbance, this weather event becomes large enough to by influenced by forces created by the earth's rotation. The tropical disturbance begins to swirl and becomes a vortex of thunderstorms. Updrafts continually pull more air into the disturbance. If the wind speeds begin to blow continuously at 23 mph, it is called a tropical depression. If the tropical depression continues to grow and gain power, it becomes a tropical storm when the wind speed reaches 40 mph. If it continues to gain strength (more thunderstorms), it becomes a hurricane when wind speeds reach 74 miles per hour!

There are 5 classes of hurricanes based on wind speeds. They begin with a Class I with winds of 74-95 mph and continue to a Class V, which has winds in excess of 155 mph!

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Topic:	Wind
Objective:	Students will successfully complete reading one book: **Feel the Wind by Arthur Dorros.**
ISBN:	0-06-445095-3
Reading Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading.

Featured Non-Fiction Book

Feel the Wind by Arthur Dorros

Summary

This book explains what causes the wind and how it affects our environment. It introduces how we can see, hear and feel the wind. It explains how the sun's rays make wind by unevenly heating up some parts of the earth and the air around it. Heated air rises, cooler air moves in to take its place and the result is wind.

People have used the wind to make wind-powered machines for thousands of years. Sailboats and gliders use wind to travel. Wind-powered machines can grind grain, saw wood, or make electricity. There are different kinds of wind ranging from gentle breezes to strong winds in storms. Some types of wind even have special names, i.e., chinook and sirocco.

Suggested questions to ask

Where is the air? It is everywhere around us, even though we can't see it. The air is what we breathe.

How can you <u>see</u> the wind? We can see the wind move things. The wind pushes the clouds across the sky. It moves the leaves on the trees.

How else can you see the wind working? Kites, weathervanes, clothes flapping on a clothesline.

How can you <u>hear</u> the wind ? You can hear the wind blowing in the window, in the cracks in your house. You can hear wind chimes.

How is the Earth heated? The Earth and the air around it are heated by the sun. Some parts of the Earth heat up more than other parts. The sun's rays are only striking half of the earth at one time, the other half is in darkness and is much cooler.

How is wind made? When hot air rises and cold, heavy air rushes in to take its place, wind is made.

What is wind? Wind is moving air.

Can the wind be used to make machines work? If so, what kind? Windmills are wind-powered machines. The blades of the windmill turn when the wind pushes against them. The turning blades move other parts. Windmills are used to grind grain, saw wood, or make electricity. Gliders and kites use the wind to fly. Sailboats use the wind to move across the water.

What is a chinook? A chinook is a warm wind that blows from the Rocky Mountains. It is so warm that in winter it can melt deep snow in just a few hours.

What is a sirocco? It is a hot, dry wind that blows from northern Africa.

Can the wind change the shape of rocks? How? Yes. Tiny bits of sand that the wind carries pound away at the rocks and wear them away over a long time. The wearing away is called erosion.

What instrument can help tell what direction the wind is blowing? A weather vane. The weather vane's arrow will point in the direction the wind is coming from.

Vocabulary

Note to Tutors
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- flutters
- ripples
- gust
- flapping
- surrounded
- equator
- shimmering
- sway
- erosion
- weather vane
- sirocco
- chinook

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Topic:	Wind
Objective:	Students will successfully complete reading one book: **Gilberto and the Wind by Marie Hall Etts.**
ISBN:	0-14-050276-9
Reading Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading.

Featured Fiction Book

Gilberto and the Wind by Marie Hall Ets

Summary
A tiny boy finds in the wind a playmate of many moods - one that can sail boats, fly kites, slam gates, and turn umbrellas inside out.

Suggested questions to ask

What does Wind whisper to Gilberto? "You-ou-ou-ou!"

What does Wind do to the balloon? The wind grabs it and carries it up to the top of a tree.

What does Wind do to clothes on the clothesline? The wind shakes the sheets, pulls out clothespins, and even tries on the clothes!

What did Wind do to Gilberto's umbrella? The wind tried to take it away. When he couldn't, he broke the umbrella.

What happens when Gilberto tries to race the Wind in the meadow? Wind always wins because he runs over the top of the grass, Gilberto must run through the grass.

What does Wind do to the big boys kites? Wind carries their kites way up to the sky and all around.

What does Wind do to the big boys kites? Wind carries their kites way up to the sky and all around.

What does Wind do when Gilberto tries to fly his kite? Wind won't help fly his kite at all, he just drops it.

What does Wind do to the apples in the fall? Wind always blows an apple down for Gilberto.

What does Wind do to Gilberto's sailboat? Wind sails it for him.

What does Wind do to Gilberto's pinwheel? First, Gilberto shows Wind how it works, then Wind blows it so fast it whistles and sings.

What does Wind do to Gilberto's soap bubbles? Wind carries the bubbles up in the air for the sun to color.

What does Wind do to the leaves that Gilberto sweeps with his broom? Wind sweeps the leaves without a broom and scatters them all around.

What does Gilbert do when Wind blows so strong he breaks trees? Gilberto runs into his house and locks the door.

Where does Gilberto sleep with Wind? They sleep together under a willow tree.

Vocabulary

Note to Tutors
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- whispering
- umbrellas
- sailboat
- squeeze
- balloon
- unlatched
- blur
- keyhole
- clothespins
- meadow
- bubbles

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Topic:	Wind
Objective:	Students will successfully complete reading one book: **Taking Flight** by Stephen Krensky.
ISBN:	0-689-81224-8
Reading Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing a variety of literature such as folk tales, legends, myths, fiction, rhymes and poems, non-fiction, and content-area reading.

Featured Non-Fiction Book

Taking Flight by Stephen Krensky

Summary
People have always wanted to fly like birds. Not until the experiments of Orville and Wilbur Wright in the early 1900's did it really happen. They tried and tried, until one day their flying machine lifted them up and away....into history, and so modern flight was born. Read the true story of how it really happened.

Suggested questions to ask

What did Wilbur and Orville Wright build in nearby Dayton, Ohio in 1899?
A cloth-covered kite which had two five-foot wings, one set above the other.

What did they own in Dayton?
A shop where they built and sold bicycles.

What is another name for this huge kite?

A glider.

What would the glider do if the sticks on the left were pulled down? How about the sticks on the right?
The glider's left wing tip twisted and the glider curved to the left. The same thing would happen except to the right side.

When did the Wright brothers become interested in flying objects and why?
In 1878, Wilbur was eleven years old and Orville was seven years old. A toy helicopter their father brought to them, which was actuated by a rubber spring and would lift itself into the air, fascinated the boys.

Were the Wright brothers the first ones to dream of flying?
No. The subject of flight had been popular since ancient times.

Why weren't Orville and Wilbur interested in hot-air balloons?
Because they only drifted on the wind and they wanted to steer their own way through the air.

What did the brothers have to do before building the glider?
They had to do a lot of research by reading books about flying machines and studying birds in flight.

What did they want to do in 1900 after building the first glider?
Build a glider big enough to hold a man and see if they could control it from the air or the ground.

What did they name this glider?
No. 1.

What is the "front elevator" and what does it do?
It is a stick, which controlled the upward or downward motion of the glider.

Who was Sir George Cayley?
He was the British inventor of the 1800's who thought that man-made wings should follow the birds' example by being curved and not flat because the air above the wing had to move faster to keep up with the air passing below the wing.

Why did most scientists of Cayley's time ignore his ideas? Did this cause him to stop his work?
They simply thought manned flight was impossible. No. Actually in 1853 one his gliders went a short way carrying his coachman.

What did the Wright brothers need in order to test their glider? Where did they go to find this?
Very strong winds to lift the curved wings. They went to a village called Kitty Hawk on the North Carolina coast, which had sandy beaches where the glider could land or gently crash.

At first the brothers had to fly the glider as a kite with no one on board but eventually one brother would lie on top of the glider's body while the other held the wing and ran downhill into the wind until the glider took off. How long did their longest glide last and how many feet did it cover?
20 seconds and 400 feet.

How long did they stay in Kitty Hawk?
They went home after a month but they returned again the next July with two assistants and camped out at Kill Devil Hills.

The second glider, No. 2, was different than No. 1. Describe the differences:
The No. 2 had legs like skis for takeoffs along a wooden track. It also had a twenty-two-foot wingspan. The No. 1 had awkward foot controls and the No. 2 had a harness for the pilot to slip into which had cables connected to the wings so that the pilot could control the glider.

Did the Wright brothers succeed in flying their glider this time around?
No. After six weeks of tinkering and having accidents, the decided that the mosquitoes were the only ones enjoying themselves.

What did Wilbur believe?
That one day man WOULD fly but he just wasn't sure it would happen in his lifetime.

What did Wilbur and Orville build in the winter of 1901-1902?
A six-foot wind tunnel, which was a long, wooden box with a fan at one end and a window in the top.

Who was Otto Lilienthal?
A German airman who shared the Wright's approach.

How did Lilienthal steer his hanging glider?
By swinging his body.

What happened in 1902 when the Wright's returned to Kill Devil Hills with their third glider?
They made almost a thousand glides, the most successful rising thirty feet in the air while traveling more than five hundred feet along the ground.

What changes made this glider so successful?
The wingspan had grown to thirty-two feet and the glider was given a vertical tail to make it more stable. The wing-warping controls were now connected to the tail fin so both could be moved at the same time allowing the pilot to adjust the glider's balance more quickly and safely.

What did the Wright Brothers have to do in order to create a TRUE flying machine?
Make their glider fly without wind by using its own source of power.

What did the Italian painter and scientist Leonardo da Vinci do four hundred years earlier?
He was the first to think of using propellers to lift people off the ground and he sketched the plan for a machine that would do so.

What do propellers do? What would a glider do if a propeller were attached to it?
They work like fans and push the air behind them as the blades turn making them go forward. It would move forward.

What problem was being faced with using a propeller to move the glider?
The propeller needed power in order to move it.

What is the name of the head of the Smithsonian Institution who built flying machines as well? How was he trying to power the propeller?
Samuel Langley. He worked with an engine that used gasoline, which was a new type of fuel at the time. But the gas engine was too heavy for the glider to lift.

What did Wilbur and Orville do with the help of Charlie Taylor, who was a mechanic that worked in their bicycle shop?
They made their own twelve-horsepower gasoline engine that weighed about 140 pounds, sixty pounds less than any similar engine.

How many days did it take for a car to make the first trip across the country?
Sixty-three.

What was the name of the aircraft that the Wright brothers worked on in Kill Devil Hills in 1903?
The Wright Flyer.

What happened to the Wright Flyer the first time they tried to fly it?
The engine stalled and the aircraft crashed into the sand.

After two days of repairing the Flyer from the crash, what happened?
It slowly gained speed and jerked up and down in the air.

Had history been made?
Yes. Even though the flight only lasted twelve seconds and the aircraft never went more than ten feet off the ground, it was the first in which a machine carrying a man had raised itself by its own power into the air.
Did Orville and Wilbur improve their flights?
Yes. Ten months later, they were taking twenty four mile flights lasting almost forty-minutes.

When did airplanes start breaking records for speed and flight?
1910

What happened in 1914? 1923? 1927?
Passengers were first carried on a twenty-two mile flight between Tampa and St. Petersburg, Florida. The first non-stop flight was taken across the country. Charles Lindbergh was the first man to fly solo across the Atlantic Ocean.

Who do we thank for leading the way of where only the birds had gone before?
Orville and Wilbur Wrights father for having given them the toy helicopter and the Wright brothers of course for fulfilling their dream!

Vocabulary

Note to Tutors
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- glider
- printing press
- actuated
- ancient
- architect
- warping
- aloft
- steer
- profit
- eager
- sateen
- rudder
- bulging
- manned
- ferry
- fuselage
- awkward
- harness
- tinkering
- airships
- unusual
- vertical
- stable
- progress
- propellers
- catapulted
- despite
- shafts
- aerodrome
- faith
- dawned
- onlooker
- aerial
- gap
- inspired
- typhoid

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Science Activity:	Assembling the "Sky Twirl" kite
Objective:	Students will successfully assemble a kite and fly it in a nearby park.
Science Standards:	**Standard 2.2:** Students know that energy appears in different forms, and can move (be transferred) and change (be transformed). In grades K-4, what students know and are able to do includes: recognizing that energy (for example, light, heat, motion, sound, mechanical) can affect common objects and is involved in common events.

Wind Activity – Assembling the "Sky Twirl" kite

Method
Students will assemble and fly a kite with the assistance of their tutor.

Materials Required

- Marker
- "Sky Twirl" kite which includes:
  - Diamond shaped black and white kite
  - Kite tail with clip
  - Winder of kite string
  - Two 14 ½" long plastic dowels with plastic cap on one end
  - 2 ½ foot long plastic dowel with plastic caps on each end and black cross connector off center of the dowel
  - 8 ½ cm. plastic dowel with plastic cap on one end and black opening on the other end
  - Colorful round spinner with black opening in the center
  - Pre-measured bridle string with hoop near the middle

Procedure

1. Lay the diamond shaped black and white kite in front of you with the corner pockets facing outwards. (*See figure 1)*

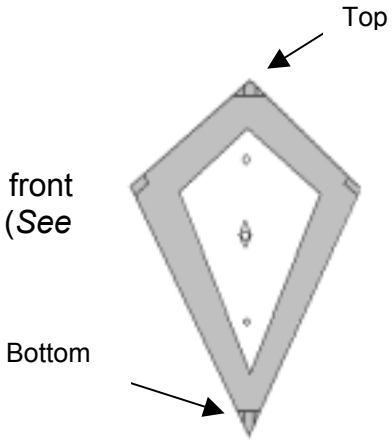
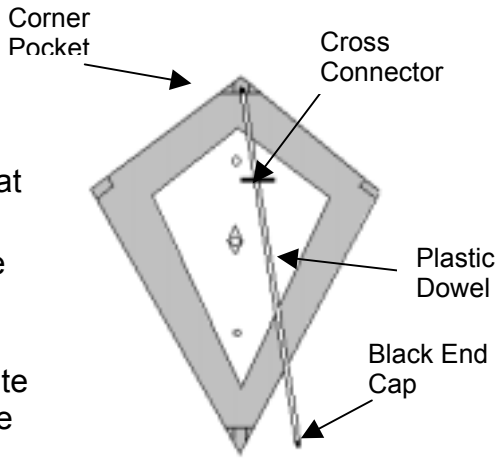


Figure 1

2. Use a marker to write your name on the white part of the kite.

3. Insert the 2 ½ foot long plastic dowel through the small pocket at the top of the kite making sure that the black cross connector is closer to the top part of the kite. (*See figure 2)*
4. Turn the 2 ½ foot long plastic dowel so that the flat part of the black cross connector is facing up.
5. Take the black plastic cap off the other end of the long dowel and slip the opening of the smallest dowel through the long dowel.
6. Push the small dowel up towards the top of the kite to the center hole of the kite and put it through the hole.



Figure

7. Take the kite tail and put the dowel through the clip leaving the rubber band on the tail.
8. Replace the end cap of the long plastic dowel and put it through the small pocket at the bottom of the kite.
9. Place your kite sideways and slip the uncapped end of one of the 14 ½ inch long plastic dowels through the hole on the black plastic cross connector.
   (*See Figure 3*)
10. Put the capped end of the plastic dowel through the side corner pocket closest to you.
11. Repeat steps 9 and 10 for the other side of the kite.
12. Make sure all the dowels are secure in the corner pockets and flip the kite over to the other side.
13. Stick the end of the long side of the string with the hoop, through the hole towards the bottom part of the kite.
14. Turn the kite over and tie the string to the dowel using a tight double knot.

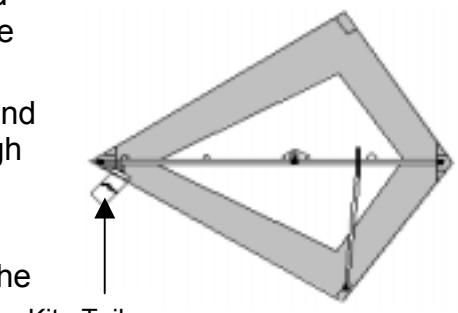


Figure 3

15. Stick the other end of the string through the hole towards the top part of the kite and repeat step 14. The outer part of your kite should look like this.

16. Pull the black cap off the end of the small plastic dowel sticking through the middle hole of the outer side of the kite.
17. Put the center hole of the colorful round spinner all the way through the small plastic dowel and replace the black cap.
18. Take the rubber band off of the tail of the kite and grab the winder of string.
19. Unravel the end of the string from the winder and tie it to the hoop of the string on the kite by using a double knot.
20. Once you find an open area away from power lines and trees, you are ready to fly your kite!

Conclusion
Wind is needed in order to fly your kite.

Safety Tips
Fly your kite on a dry day when the wind is blowing. Choose a wide-open space, free of trees, buildings and other large obstructions. If you have to walk or run with the kite, look in the direction you are going. Watch out for people, streets, or anything hazardous in your path. **Do not fly near electric power lines.**

Launching your Kite
Stand with the wind at your back. Hold the line in one hand and the top of the kite in the other so that, the kite is right side up with the wheel facing you. When you feel the pressure of the wind against the kite, let go. As the wind takes the kite up, slowly release more line. If the kite begins to drop, give a full, hard tug on the line to make the kite climb. As long as there is tension on the flying line, the kite will stay up.

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Science Activity:	Assembling the "Frustrationless" kite
Objective:	Students will successfully make a wind machine – a kite - and, if time permits, fly it at school.
Science Standards:	**Standard 2.2:** Students know that energy appears in different forms, and can move (be transferred) and change (be transformed). In grades K-4, what students know and are able to do includes: recognizing that energy (for example, light, heat, motion, sound, mechanical) can affect common objects and is involved in common events.

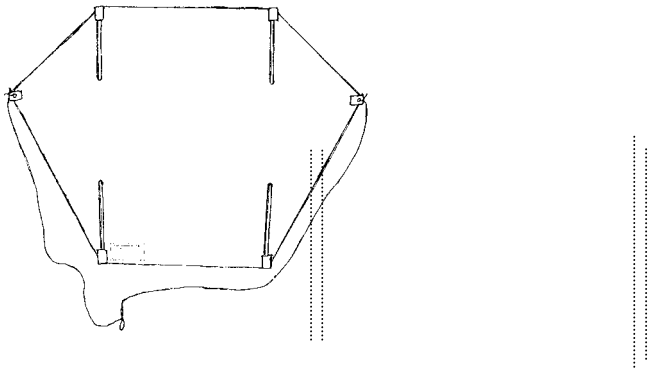
Wind Activity – Assembling the "Frustrationless" kite

Method
Students will construct a kite with the assistance of their tutor.

Materials Required

- Pre-cut kite sail
- Two 2-foot-long wooden dowels
- Two tiny wooden dowels
- Sheet of six pieces of tape
- Pre-measured bridle string (the string permanently tied to the kite)
- Roll of kite string
  NOTE: The end of the string is not connected to the spool of string, therefore if all of the string is let out while your student is flying his/her kite it will fly away. When your student gets close to the end of the string have them firmly hold the end of the string. Do not have them wind the end of the string around their hands, since the kite could pull the string tightly around their hand and cut off the circulation.
- Hole punch
- Markers and/or crayons to decorate the kite

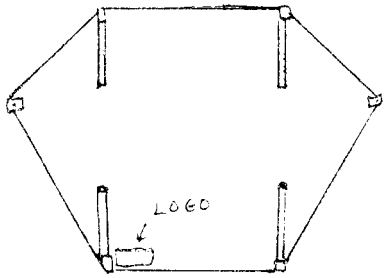
What the finished kite will look like



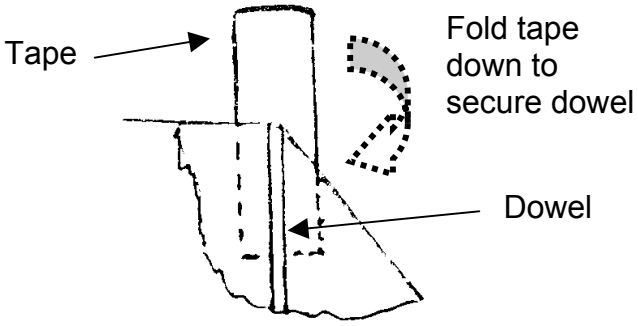
Procedure

The kite is easiest to build on a flat hard surface.

1. Lay the kite flat so the bottom is closest to you (ID stamp on the bottom).
2. Insert the large dowels through the precut holes in the kite. The dowel runs from the top edge to the bottom edge. The middle of the dowel is covered and the ends are exposed on the front of the kite. The dowels must be parallel.

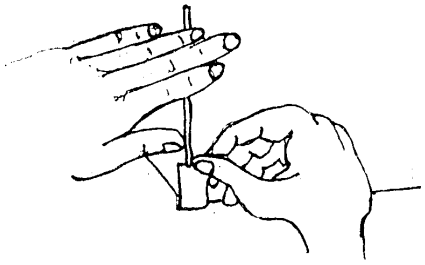


3. Secure each dowel en ID Stamp ner. Lift the corner of the kite where the dowel lies. Slide one piece of tape underneath with the sticky side up. One half of the piece of tape sticks up onto the back of the kite and the other half extends off the edge. The tape runs in the same direction as the dowel, up and down.

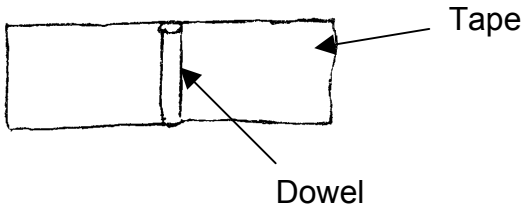


4. The dowel ends must meet the edge of the kite. Hold the dowel down to keep it from slipping. Fold the extended tape onto the front of the kite so it

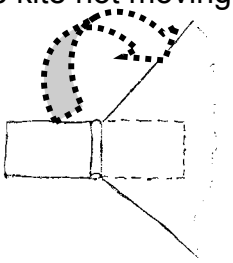
forms a pocket over the dowel end. Firmly rub or scratch the entire surface of the pocket to keep air and dirt from getting between the kite, tape and dowel.



5. To make reinforcements for the bridle, lay a tiny dowel across the middle of the piece of tape.

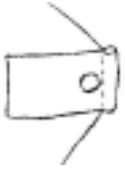


6. Slide the tape, sticky side under one of the short outside edges of the kite until the dowel sits right alongside the edge. Fold the extended tape onto the front of the kite not moving the dowel.



Fold tape over dowel onto back of kite

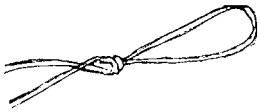
7. Repeat this procedure on the opposite outside edge.
8. Punch a hole through the tape right beside the tiny dowels with a paper punch or a nail.



9. Using the string, tie a knot in the holes of the reinforced ends.

10. Fold the kite in half pinching the reinforced edges together in one hand. With the other hand, pull the string towards you to find the center of the string.

11. Hold the center and tie an overhand knot about an inch from the center. This will form a small loop. Tie and knot the spool of kite string to the small loop.



12. You are now ready to fly your kite.

Conclusion
The kite must be built properly in order to fly.

Safety Tips
Fly your kite on a dry day when the wind is blowing. Choose a wide-open space, free of trees, buildings and other large obstructions. If you have to walk or run with kite, look in the direction you are going. Watch out for people, streets, or anything hazardous in your path. Do not fly near electric power lines.

Launching your Kite
Stand with the wind at your back. Hold the line in one hand and the top of the kite in the other so that, the kite is right side up and the picture faces you. Toss the kite up into the wind. As the wind takes the kite up, let out more line. If the kite begins to drop, give a full, hard tug on the line to make the kite climb. As long as there is tension on the flying line, the kite will stay up.

Trouble Shooting
If your kite seems to circle or dive to one side only, check to see if the bridle loop is tied at the exact center of the bridle. If it is not, detach your flying line and reposition the loop now.

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Topic:	Winter Holiday
Objective:	Students will successfully complete reading one book: **Nine Days to Christmas** by Marie Hal Ets and Aurora Labastida.
ISBN:	0-14-054442-9
Reading Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories. **Standard 6:** Students read and recognize literature as a record of human experience. Read classic and contemporary literature, representing various cultural and ethnic traditions from throughout the world. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing literature as a way to explore the similarities and differences among stories and the ways in which those stories reflect the ethnic background of the author and the culture in which they were written.

Featured Fiction Book

Nine Days to Christmas by Marie Hall Ets and Aurora Labastida

Summary

Ceci is old enough to have a posada of her own, one of the special Mexican parties given on the nine nights before Christmas. All of the people in the village will be there, and there will be delicious things to eat. Best of all, Ceci will be able to choose the special pinata for her posada. She can hardly wait!

Suggested questions to ask

Ask your student if he/she celebrates posada? Also, tell them what you do for the holidays.

Have they ever had a posada at their house? If yes, ask them what it was like.

Ask your student if he/she has ever had a pinata? If so, what was the occasion?

How long was Ceci's and Salvador's winter break from school? December to February.

Ask the student if he/she has ever made tortillas?

What was Ceci's doll's name? Gabina. Ask your student what his/her favorite toy is and why.

What kind of pet did Ceci have? Birds

What bird did Ceci want to be when she took an ice cold bath? Duck

How does Ceci's family heat the water? They need to light the heater to warm the water before they can take a bath.

Where did Ceci go with her mother to get her pinata? The old Mexican market, not the big new supermarket.

What pinata did Ceci choose for her posada? The star.

What goodies did Ceci put in her pinata? Big juicy oranges, tiny sweet lemons, peanuts, candies wrapped in pretty papers, and red-and-white sugar canes.

What type of tree did they hang the pinata on? Jacaranda tree

What did Ceci and her cousin Manuel carry at the front of the procession? Joseph, Mary and the donkey.

What song did everyone sing? The song of the Holy Pilgrims. Ask your student if he/she has ever heard this song, how does it go?

When Ceci knocked on the closed door, what did the people inside first say? "No. There's no room in the inn!"

What is the song that the children sing before they start hitting the pinata? "I don't want gold! I don't want silver! What I want is to break the pinata!

Was Ceci happy that the children broke her pinata? No

What happened to the star pinata? The star told Ceci that since she chose the star for her first posada, the star had become a REAL star in the sky.

Vocabulary

Note to Tutors:
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- posadas
- tortillas
- scolding
- stretching
- excitement
- pinata
- patio
- frightened
- jacaranda
- scrambling
- twitch
- quack
- enormous
- procession
-

Coalition for
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Topic:	Winter Holiday
Objective:	Students will successfully complete reading one book: **The Mitten** by Jan Brett.
ISBN:	0-399-21920-X
Science Standards:	**Standard 1:** Students read and understand a variety of materials. In grades K-4, what the students know and are able to do includes: using a full range of strategies to comprehend materials such as directions, nonfiction material, rhymes and poems, and stories.
Standard 6:	Students read and recognize literature as a record of human experience. Read classic and contemporary literature, representing various cultural and ethnic traditions from throughout the world. In grades K-4, what students know and are able to do includes: reading, responding to, and discussing literature as a way to explore the similarities and differences among stories and the ways in which those stories reflect the ethnic background of the author and the culture in which they were written.

Featured Fiction Book:

The Mitten by Jan Brett

Summary:

The Mitten is a Ukrainian folktale with great illustrations. Set in the far north in the winter, it is clearly snow country. A Ukrainian boy, Nicki, asks his grandmother to make him white mittens. She is reluctant because white mittens are easy to lose in the white snow, but she agrees to make him a pair. Nicki loses one mitten, and the story describes how all the animals in the forest like the mitten as they try one-by-one to snuggle into it. The animals show great tolerance in allowing more and more animals in, but the mitten becomes really stretched in the process. Nicki gets his lost mitten back just in time to go home.

Do notice that there are two sidebar pictures on each page showing what Nicki or some of the animals are up to while the main story is depicted in the center of the page (these can make for additional questions/conversation).

Suggested questions to ask

Where is the Ukraine? East of Poland and Romania, north of the Black Sea, west of Russia, and south of Belarus. Have your student find it on a map. Compare its latitude (horizontally across the map or around the globe) with Colorado and other places your student knows or has visited.

Have you ever seen snow? What is snow? Snow is a form of frozen water (condensed, frozen water vapor in crystal form).

What is wool? Where does wool come from? Wool is spun from the "hair" or "fur" of a sheep. Wool is **very** warm. It does not let the heat from your body escape easily. It traps heat close to your body and makes you feel warm.

Why did Nicki's grandmother not want to make Nicki a pair of mittens? She was worried that he would lose his mittens in the snow because the mittens would be white and the snow was white, so they would be difficult to see.

What do the roofs appear to be made out of? Straw or hay.

Have you ever seen a roof made out of straw?

What is a mole? A mole is an insectivore (not a rodent), they look similar to a mouse, but their bodies are longer. They have pig-like snouts. They are considered to be a garden "pest".

What is a snowshoe rabbit? A snowshoe rabbit is a rabbit with **very** big feet. The big feet make it easy for it to hop around in the snow without sinking through the surface and being easy to catch by its predators.

What is a hedgehog? A hedgehog is a mammal that is related to the mole family. It is nocturnal (comes out at night, sleeps during the day) and likes to hibernate during the winter (sleep in for many months) just like a bear. It has spiny, sharp quills that would hurt you if you brushed up against it.

What is an owl? An owl is a large, nocturnal (comes out at night, sees very well at night) bird of prey (it attacks and eats other animals – rodents, insects, small birds). Owls usually have a flat face and its eyes are big and directed or facing forward (not on the sides of its head like many other birds).

What is a badger? A badger is a mammal that is a member of the weasel family. It is also a nocturnal animal (comes out at night). They are fierce fighters with sharp claws, long snouts, and rough, grizzled fur.

Why do you think all these animals are nocturnal (come out at night)? These animals come out at night because it is safer to come out in the dark since the other animals won't be able to see them as easily and possibly attack them.

What is a fox? A fox is a carnivorous (eats other animals) mammal of the dog family. A fox almost looks like a small dog with its pointy face, thick fur, and bushy tail.

What is a bear? A bear is a large, powerful mammal. It is omnivorous (meaning it will eat just about anything – berries, leaves, insects, animals. Bears usually hibernate in the winter (sleeping for a long period of time – weeks or months).

What is a meadow mouse? A meadow mouse is a small rodent that lives in open fields and meadows. They can be dangerous as they occasionally carry infectious diseases.

What is an acorn? An acorn is the fruit of an oak tree. It is a source of food for squirrels, chipmunks, and other animals. It is also used to make oil and tannin (Tannin is used in making inks and dyes. It is also used in leather-making – it helps make the leather resist decomposition.)

Vocabulary Words:

Note to Tutors:
These are only suggestions – **your vocabulary words** should be ones that are **new** and/or **presented some difficulties** to your student. **Spelling, pronunciation,** and general meaning or usage should be emphasized (precise definitions are not necessary).

- mittens
- wool
- knit
- safe and sound
- mole
- tunneling
- burrowed
- cozy
- snowshoe rabbit
- hopping
- admire
- wiggled
- big kickers
- hedgehog
- snuffling
-
-
- jostled
- prickles
- commotion
- swooped
- glinty
- talon
- badger
- diggers (paws w/ claws)
- snug
- waft
- fox
- trotting
- investigate
- drowsy
- lumbered
- spied
- plumped
- swelled
- bulged
- meadow
- acorn
- wriggled
- whiskers
- enormous
- silhouette